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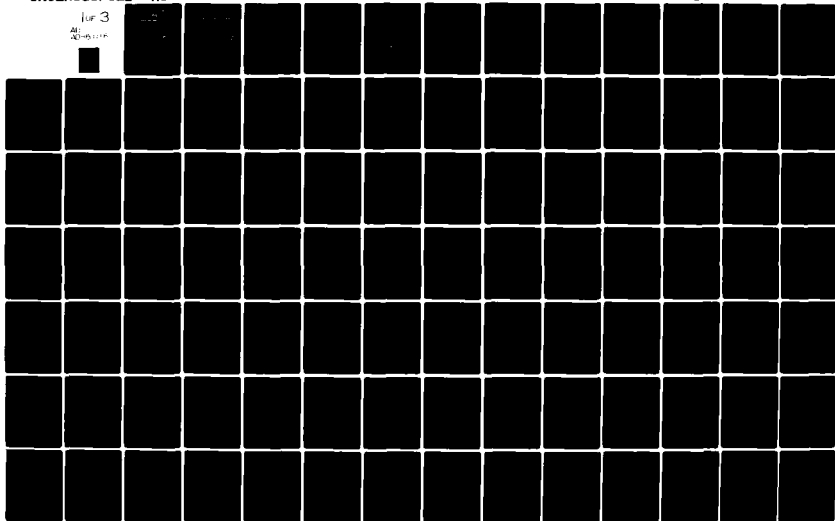
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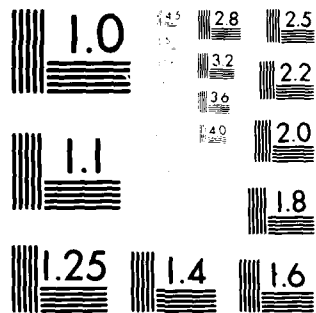
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INTRODUCTION

This study is an attempt to describe in a short format how the Soviets built an air force and how they used it over the last six decades. It is not a work based on scholarly research in original sources, but rather a tale derived from the research of others. The story should be of interest to American military personnel since it concerns the infancy, adolescence, and present maturity of the Soviet Air Forces (VVS), now one of the two most powerful air forces in the world--and it seems as if the VVS is not averse to becoming number one.

When the Bolsheviks came to power in November 1917, they inherited a higgledy-piggledy Tsarist air force made up of obsolescent foreign-type aircraft, either imported or manufactured in Russia under license. The one exception was Sikorsky's "Il'ya Muromets," the largest bomber and only successful four-engine plane of that time. Air power was a negligible factor in the Civil War between the Reds and the Whites (1918-21) as aircraft were scarce, the little fuel available was unbelievably awful, and the combat theaters were enormous. Airplanes did, however, play havoc with cavalry since they could locate them easily from the air and were effective in low-level attacks. ←

During the NEP era (1921-28), the Red Army as a whole and the air force in particular developed slowly and erratically. It simply could not get the modern weapons needed for a first-class army. ✓

Probably the most fruitful input in that period as far as the air force was concerned was its close connection with the German *Wehrmacht*. Then came Stalin's decision to industrialize Russia at a forced tempo and with a very heavy bias toward the military-industrial complex. It then became possible to build an indigenous aircraft industry, to turn out Russian-built planes.

The new aircraft were tried out in Spain, in the Sino-Japanese War, and directly against the Japanese at Lake Khasan in 1938 and at Khalkhin-Gol in 1939. But the performance of the Soviet air force, like the Red Army in general, was miserable in the Winter War against Finland in 1939-40--"miserable" is really a euphemism in this case. Incidentally, much of the expertise acquired by the Soviet officers in Spain, China and Outer Mongolia was liquidated by Stalin in his purge of the military in 1937-40 when some 80 per-cent of the top officers in the Red Army went down the drain.

World War II was the real test for the Soviet air force and it nearly flunked when the *Luftwaffe* caught most of the Russian aircraft on the ground in the first days of the war. The Soviets were able, however, to move much of their aircraft industry eastward out of German range during the summer and fall of 1941. By mid-1942 the planes were again coming off the production lines. Since most of the Soviet losses in the summer of 1941 were planes destroyed on the ground, experienced pilots were available to fly the new aircraft. By 1943 the Russian pilots were facing up to the *Luftwaffe* and by late 1944 the Germans were being drowned in

a flood of Soviet aircraft.

The Soviet Union emerged from World War II with an enormous array of ground forces and a plentitude of close-support aircraft, but as a nation was facing what it regarded as a potentially hostile United States with a strategic air force, a monopoly on the atomic weapon, and in control of the seas. It is not surprising that Stalin concentrated on what he felt to be the two necessities for Russian defense: the acquisition of the nuclear weapon and an adequate air defense against SAC, i.e. interceptors, radar, and anti-aircraft artillery. When those objectives were nearing completion, he turned his attention to the production of delivery vehicles for his nukes. By 1954-55 the Soviets had two long-range bombers (the Tu-95 BEAR and the Mya-4 BISON) as well as a medium-range Tu-16 BADGER.

Nikita Khrushchev's rise to power in the late 1950s coincided with the Soviet development of the ICBM. Overly impressed by the new delivery vehicle, Nikita pushed too hard in gambits all over the globe and he came a cropper in Cuba in the autumn of 1962. He tried to do too much with too little and had his bluff called in a humiliating manner.

His successors, Brezhnev and Kosygin, did not really change Khrushchev's objectives, but they did forego pushing them until they had the military wherewithal to back up their ploys. The result is now obvious: Admiral Gorshkov's new blue-water navy, an arsenal of missiles of all shapes and sizes, an enormous Ground

Forces equipped with excellent weapons, and an Air Force (VVS) second only to the USAF [mayhaps my patriotic bias]. As John Erickson has pointed out, while we were transfixed watching Gorshkov conjure up his navy, the Soviet military planners increased their air power by leaps and bounds over the last few years.

The description of today's VVS, its organization, inventory, and resources, is relatively thin in this study. The reason is that a follow-on study now under way will deal with those subjects in some detail.

CHAPTER I

THE BEGINNINGS

Although Russian scientists and inventors were among the early-birds in the field of aviation, the poorly developed industrial-technological milieu tended to thwart their efforts. This was especially true in the area of engine development. Some progress was made, however, in the decade preceding World War I and during the war itself. But the momentum was slowed to a snail's pace by the subsequent revolutions, the Civil War, and the painful process of economic recovery during the NEP period (1921-28).

1. THE TSARIST HERITAGE

Despite Peter the Great's Herculean efforts at the beginning of the 18th century to push Russia screaming and kicking into the mainstream of Western scientific and industrial development, the nation moved with glacial sluggishness for the next two centuries. It was not until the last two decades of the 19th century that the industrial "take-off," to use Rostow's term, began, and although progress toward Western industrial levels was rapid between the 1880s and World War I, the gap between East and West was just too great to be bridged in such a short time. Thus it was not until the mid-1930s that the nation began to approach Western levels of industrial and technological accomplishment.

Russian Pioneers in Aeronautics. As early as the second quarter of the 18th century, Mikhail V. Lomonosov, one of the founders of

the Academy of Sciences in 1725, was conducting research in aerodynamics and he even demonstrated a model of a helicopter in 1754. But for the next 150 years the Russian pioneers, like their counterparts in the West, were unable to get a heavier-than-air flying machine off the ground because they lacked an engine with requisite power and lightness.

Aleksandr F. Mozhaisky (1825-90), a retired naval officer, constructed a machine in the 1880s which demonstrated the engine problem. His aircraft was a monoplane with a forty-foot wing span, which, if one can judge from the drawings he left behind, seems to have been aerodynamically sound. But his power-plant, two steam engines with a combined output of 30 horse-power, just did not have the strength to get his craft into sustained flight. Mozhaisky launched his vehicle down a ramp in 1884 and it did hop off the ground for a few feet. But it hopped far enough to provide some Soviet historians with a tenuous claim that Mozhaisky was the inventor of the first successful heavier-than-air flying machine.¹

The great Russian chemist, Dmitry I. Mendeleyev, compiler of the periodic system of atomic weights, encouraged Mozhaisky in his endeavors. Mendeleyev himself was a pioneer in high altitude ballooning and designed

¹During the silliest phase of the "Russian firsts-in-everything" in the early 1950s, a book by two overly enthusiastic Mozhaisky boosters pushed the claim to ridiculous lengths. See N. Cheremnykh and I. Shipilov, *A. F. Mozhaisky: Sozdatel' Pervogo V. Mire Samolyota* [A. F. Mozhaisky: Inventor of the First in the World Airplane], Voennoe Izdatel'stvo Ministerstva Oborony Soyuza SSR, Moskva, 1955. A review of the book in *Voprosy Istorii* [Problems of History], 1950, Vol 6, pp. 124-26 blasted the book to a fare-thee-well.

an efficient altimeter. Until the Wright brothers' success at Kitty-hawk in 1903, however, most of the Russian efforts in the aeronautical field were directed toward lighter-than-air vehicles, either balloons or airships.²

The First Faltering Steps (1900-1914). Encouraged by the successes of their counterparts abroad, Russian would-be inventors began to design and construct gliders, including the young Andrey N. Tupolev. The glider, sans engine, gave them a chance to experiment with aeronautical design without coping with the gruesome problem of an engine light enough to be carried aboard the primitive airframes being developed.

Probably the most famous name in the history of Russian aeronautics is that of Nikolay Y. Zhukovsky (1847-1921). By 1876 Zhukovsky was publishing works on hydrodynamics and it was but a short step from there to aerodynamics. He became a professor at the Moscow Higher Technical School (*Vysshee Tekhnicheskoe Uchilishche*), and in 1902 he built the first wind tunnel in Russia to facilitate his research in the theory of flight. In 1904, Zhukovsky established the Institute of Aerodynamics at Kuchino, a suburb of Moscow. Without too much exaggeration it can be said that Zhukovsky single-handed provided the theoretical foundation for Russian aviation in the first decades of its infancy. His students, including such giants as Tupolev,

²See Nowarra, Heinz J. and G. R. Duval, *Russian Civil and Military Aircraft, 1884-1969*, London, Fountain Press, 1971, Appendix A, pp. 273-75, for a good description, pictures and all, of Russian airships and balloons in the early 1900s.

Arkhangelsky, Yuriev, and Mikulin, were to dominate the field of aviation long after Zhukovsky's death.

On the practical level, i.e. the production of heavier-than-air jallopies that could get into the air and stay there for short periods, Igor I. Sikorsky (1889-) is the best example of the first generation of aircraft designers (and builders cum fliers), the generation that got heavier-than-air machines off the ground literally on a wing and a prayer. Inspired by the achievements of the Wright brothers, Sikorsky went to Paris in 1909 to obtain an engine and parts for a helicopter he was working on, and while there he haunted the airfields near Paris to watch and talk with the "pilots" who were bumping and hopping their primitive machines up and down the fields. He finally obtained what he considered to be the most reliable engine available, a three-cylinder, 25 hp Anzani, the same engine that was to power the aircraft of Bleriot when he crossed the English Channel some months later.

Upon his return to Kiev, Sikorsky completed his helicopter, but it just wouldn't get into the air. Then back to Paris for more parts and better engines. But his first airplane, a pusher biplane, called the S-1, with an Anzani 15 hp engine would not fly either. Finally, in June 1910 he came up with his S-2, a tractor biplane with a 25 hp Anzani, and he managed to get it into the air a number of times (for a total of eight minutes) before it crashed. It should be noted that not only was Sikorsky designing and building his own planes, but was also learning to fly in those primitive machines. His

first flight of any kind was in his S-2 on its maiden voyage. His next aircraft, the S-3, with a 40 hp Anzani engine, accomplished 12 flights (a total of seven minutes in the air) in December 1910 before crashing. In 1911 Sikorsky produced the S-5, powered by a 50 hp, water-cooled Argus engine and by May he was accomplishing sustained flights of 30 minutes duration at an altitude of 1,000 feet. Incidentally, he got his pilot's license in the autumn of 1911--high time it would seem!

In August 1911, Sikorsky began work on the S-6, a three-seater, with a 100 hp Argus engine; he tested it in December 1911 and it attained a maximum speed of 113 kilometers an hour (70 mph). He won the highest award at the Moscow Aircraft Exhibition in February 1912, and on the basis of his S-6 he was employed by the Russo-Baltic Waggon Factory as designer and chief engineer of the company's aircraft division. As Sikorsky puts it in his autobiography: ". . . the contract stipulated my right to build not less than one experimental airplane of a new type every year, at the expense of the company. . . . Looking back, it astonished me that so much had been accomplished in three years."³

But it was his next achievement that assured Sikorsky of a niche in the aviation hall of fame, namely the production of the world's first successful four-engined aircraft. By November 1912 construction was underway on what the workers called "The Grand," an aircraft

³Igor I. Sikorsky, *The Story of the Winged-S*, New York, Dodd, Mead, 1967, pp. 62-63.

weighing 9,000 lbs, with a wing-span of 92 feet, and powered by four 100 hp, four-cylinder, water-cooled Argus engines mounted on the leading edges of the lower wings. It was first flown on 13 May 1913, with Sikorsky at the controls, and was an instant success. The plane was officially designated the "Russki Vityaz" (Russian Knight), although Sikorsky maintains that its first nickname, "The Grand," remained more popular.⁴

Of course, Sikorsky was not alone in the design and production of aircraft in the 1910-14 period just before World War I. Yakov M. Gakkel' (1874-1945), better known abroad as Joseph Hackel, designed a number of aircraft between 1908 and 1912, some of which flew rather well for the period, especially his Type No. 7 with its capability of climbing at a rate of 300 feet a minute. In 1912, a St. Petersburg designer, A. A. Porokhovshchikov, produced a two-place biplane with a twin-tail (called *BiKok* in Russian from the French *BiCoque*) which could do over 60 miles an hour and climb at 600 feet a minute. It could also be folded up for transport. But the government refused to even test it--apparently put off by the designation "BiKok."⁵ In 1912 Dmitry P. Grigorovich (1893-1938) began to build hydroplanes and his M-5, flown in 1914, was ". . . for many years

⁴*Ibid.*, p. 90.

⁵Nowarra and Duval, *op. cit.*, p. 30.

regarded as the best in the world."⁶

Despite the feats of Russian designers, the main output of aircraft was foreign types manufactured under license in Russia. For example, the Duks plant in St. Petersburg, on the eve of World War I, was building Russian versions of French airframes and engines, mainly Farmans, Voisins, and Nieuports along with Gnôme engines.

The outstanding Russian-designed aircraft on the eve of the war was the Sikorsky "Il'ya Muromets," an improved version of the "Russki Viyaz," first flown in December 1913. In February 1914 Sikorsky flew the aircraft with a payload of almost 3,000 lb (15 passengers) and in July 1914 he flew it from St. Petersburg to Kiev and back. The Tsar, Nicholas II, was impressed by the "Il'ya Muromets" as was the Imperial Navy which ordered a version of it for reconnaissance.

On the eve of the first World War, the Russians had a total of 263 military aircraft, mostly imported from France or built in Russia under license.⁷ The main types were the Nieuport-4, the Farman-16 and -22, and the "Il'ya Muromets." These aircraft were powered by engines which ranged in horsepower from 70 to 150 hp, and the planes had top speeds ranging from 90 to 100 kilometers per hour (56 to 62 mph).⁸

⁶B. L. Simakov and I. F. Shipilov, *The Air Fleet of the Land of the Soviets (Vozdushnyy Flot Strany Sovetov)*, Moscow, 1958, p. 62. Simakov and Shipilov are awfully biased in favor of Russian "firsts" and "bests-in-the-world."

⁷*Great Soviet Encyclopedia* (English translation of the 3rd edition), New York, Macmillan, 1974, Vol 5, p. 15.

⁸Simakov and Shipilov, *op. cit.*, p. 93.

Russian Aviation in the First World War. Although the number of aircraft available to the Russians at the outset of World War I looks rather puny when viewed from the 1970s, none of her enemies or allies had a much more extensive inventory. For example, the Germans had 232 planes, the British 130, and the Austrians only 65. The real weakness of Russia, a weakness to be vividly demonstrated as the war dragged on, was her poor industrial base, made much worse by the inability of the government to organize or utilize it expeditiously. As a result, over the forty months that Russia managed to stay in the war, her air force fell farther and farther behind that of the Germans. With the single exception of the Sikorsky bomber, the "Il'ya Muromets," Russian pilots had to face opponents flying superior machines.

The 263 aircraft that Russia had at the outset of the conflict were not all in good shape or even combat machines--for example, 39 of them were trainers. They came in all shapes and sizes, but the vast majority were of French origin, and all the engines were foreign, again mostly French. The training of pilots had been a rather haphazard matter up to the outbreak of the war and in 1914 there were more aircraft than trained people to fly them. The importation of foreign aircraft and engines was a difficult task once the war started since the Germans controlled the land area between Russia and her chief supplier, France. Thus the planes had to be shipped via Murmansk or Arkhangel, a long and rather hazardous journey because the freighters had to run the German submarine gauntlet.

To make matters worse for the Russians, the French, who had initially promised 15 percent of their aircraft output, reneged on that pledge in order to supply their own needs. For example, of the 586 planes and 1,730 engines on order in France up to the end of 1915, the Russians received only 250 aircraft and 268 engines.⁹ Furthermore, according to the Russians, they got only obsolete planes and sometimes even secondhand ones at that!

When it became evident that dependence upon the Allies for aircraft and engines was a fragile thing at best, an effort was made to produce indigenous aircraft and to build French types in Russia under license. But during the period of World War I, the Russian aircraft industry consisted of only eighteen airframe plants and nine engine factories.¹⁰ Russian-built Nieuports, Farmans, and Voisins were not only inferior to the contemporary German aircraft, but were even inferior to their French originals.

The attempts to produce indigenous reconnaissance-fighter aircraft was not too successful. Sikorsky designed and produced his RBVZ-16 (Russian-Baltic Wagon Factory) in early 1915, but its 80 hp Gnome engine could not deliver enough speed and the plane was outclassed by its main opponents, the Fokker D-II and -III. It was, however, one of the first aircraft to carry a machine-gun synchronized to fire

⁹*Ibid.*, p. 103.

¹⁰A list of the factories can be found in Nowarra and Duval, *op. cit.*, pp. 33-34.

through the propeller.¹¹ In 1916 Sikorsky came up with the RBVZ-20 which had a top speed of 118 miles per hour, very good for that period. But the Russian-Baltic plant was under great pressure to turn out bombers, so Sikorsky's fighter was dropped.

Dmitry P. Grigorovich, employed by one of the major aircraft manufacturers, the First Russian Aviation Works of S. S. Shchetinin and Co. in St. Petersburg, had produced his first "flying boat" in 1910, the M-1, powered by a Gnome 50 hp engine. On the eve of World War I, he came up with his M-5, a seaplane with a 100 hp Clerget engine and capable of a maximum speed of 78 mph. It became popular with the Imperial Navy. In 1916, however, he developed his most successful seaplane, the M-9, powered by a Salmson 150 hp engine which could drive the plane at good speed. It was officially designated a reconnaissance-bomber, but, according to Nowarra and Duval, it would have been more appropriate to call it a "flying-boat fighter."¹² It went into quantity production for the Russian Navy.

The Anatra factory in Odessa produced an indigenous reconnaissance-fighter in 1915, the notorious Anatra V-1, which was so unmanageable as to be a greater threat to the Russian pilot than to his German opponent. Its follow-on, the "Anade," was a better plane, but it was hard to sell its virtues to the Anatra-shy Russian airmen.

During the war the Russians used 14 or more different types of

¹¹Nowarra and Duval, *op. cit.*, p. 35.

¹²*Ibid.*, p. 43.

fighter-recce aircraft, and only four of them were Russian-designed. Most Russian pilots did their fighting in Nieuports, Morane-Saulniers, Voisins, and Sopwiths. Early in 1917 they began to get some decent aircraft such as the Nieuport-17 with a 110 hp Rhone rotary and the Spad-7 with a 200 hp Hispano-Suiza engine which pushed it along at over 120 mph. But this was pretty late in the game: the Tsarist regime had fallen and the Provisional Government was flubbing around trying to get a handle on things.

The one bright spot in the somewhat dismal Russian experience in the air war against the Central Powers was in the area of the heavy bomber. Sikorsky's "Il'ya Muromets" was a "first," a four-engine bomber in an era when most designers were dubious about the viability of multi-engine aircraft. In fact, no one else, either enemy or ally, produced a comparable aircraft during World War I.

The Emperor, Nicholas II, and the Ministry of War, were so impressed with the "Il'ya Muromets" that in December 1914 they put the head of the Baltic-Russian Wagon Factory, M. V. Shidlovsky, on active duty as a Major General to head a new outfit, the "Flying Ship Squadron" (*Eskadra Vozdushnykh Korablei*), made up of Sikorsky four-engine bombers. By early January 1915, General Shidlovsky had established a base near Yablonna, only 25 miles behind the front-line, a base replete with three bombers, repair facilities, a meteorological team, and logistical paraphernalia. On 15 February one of the "Il'yas" made the first raid over German territory and dropped 600 pounds of

bombs.¹³ Over the next two years, Sikorsky constantly improved his bomber and by August 1916, Type Ye-2 of the "Il'ya Muromets" series could tote a one-ton bomb load and carried an arsenal consisting of eight Lewis guns and a 50mm rapid-fire cannon.¹⁴ The Oranovsky aerodynamically shaped bombs plus a homemade bombsight gave the "Flying Ship Squadron" a remarkably accurate bombing capability.

The field commanders and the Navy were so enthusiastic about the "Il'ya Muromets" as it demonstrated its prowess under Shidlovsky's direction that the Baltic-Russian Wagon Factory was hard put to keep up with the orders. Between the time of the first raid in February 1915 and the October Revolution in 1917, Shidlovsky's outfit carried out 442 raids and dropped over 2,000 bombs.¹⁵ The Ministry of War ordered a total of 76 "Il'ya Muromets" bombers during the war.¹⁶

When the war began, the military commanders on both sides were rather vague about what to do with their air forces. The most obvious role was reconnaissance, the air force to act as the eyes of the ground commanders in ascertaining enemy deployments and as spotters for the artillery. At the beginning of the war, the reconnaissance aircraft were unarmed, but it was not long before the more

¹³Sikorsky, *op. cit.*, pp. 126-127.

¹⁴Nowarra and Duval, *op. cit.*, p. 41; the arsenal was so effective that only three "Il'ya Muromets" bombers were lost to enemy fighters during the whole war.

¹⁵*Ibid.*, p. 52.

¹⁶Sinakov and Shipilov, *op. cit.*, p. 97.

belligerent of the pilots were seeking ways to knock off their competitors. They began to carry pistols and carbines and then graduated to machine-guns. Simakov and Shipilov in their account of Russian aviation in World War I, devote an inordinate amount of space to describing their favorite ace's efforts to devise tactics to destroy enemy aircraft.¹⁷ By early 1915 the machine-gun was being strapped to the plane and soon it was synchronized to fire through the propeller. Then pilots began dropping things on ground targets or firing at the ground troops. By the middle of the war, the aircraft, although still invaluable as a reconnaissance vehicle, had developed into the weapon system it was to be up to the present, albeit somewhat primitive in comparison with the aircraft to come later.

During the more than three years that Russia was in the war, its aviation industry produced 1,893 planes and 920 engines; most of the aircraft were Russian-built French types. In that same period, a total of 1,400 planes and 3,600 engines were imported. Except for 80 British *Sunbeam* engines and 250 British aircraft, the imports all came from France.¹⁸ General Golovin points out that in September 1916

¹⁷*Ibid.*, pp. 106-111. The authors, *mirabile dictu*, manage to avoid any mention of the outstanding Russian ace in WW I, Kazakov, while they devote pages to their hero, Petr N. Nesterov, and although they devote several pages to the "Il'ya Muromets" in all its manifestations, they never mention its creator, Igor Sikorsky. If you did not join the Red Air Force during or shortly after the October Revolution, you just do not get your name in the histories, even though your actions or creations are discussed at length.

¹⁸Nowarra and Duval, *op. cit.*, p. 49. Considering how vague statistics concerning World War I are in general, the exactitude of the above cited figures seem unbelievable. But they are probably in the ballpark for the most part.

the Russian air force had 716 planes, 502 pilots, and 357 observers. But the ground forces had grown enormously in size since the onset of the war and, consequently, were badly in need of more and better air support. The German air force had improved dramatically.¹⁹ In short, the Russian aviation industry was just not able to come anywhere near supplying the planes, engines, and armament needed to keep the Russian air force competitive.

2. THE BOLSHEVIKS AND AVIATION (1917-1921)

The Bolsheviks* faced two military problems in the eight months that elapsed between the February Revolution and their own triumph in the October Revolution: How to destroy, or at least neutralize, the existing Russian Armed Forces, and how to build a military force of their own, a force big enough to enable them to seize power. The peculiar power complex that arose out of the February Revolution, however, helped the Bolsheviks enormously. The Provisional Government, the ostensible state power, wielded authority only insofar as it could persuade the Petrograd Soviet of Worker's and Soldier's Deputies

¹⁹N. N. Golovin, *The Russian Army in World War I*, Archan Books, 1969, pp. 150-151.

*Lest the terminology become too confusing, a few definitions would seem in order. "Bolshevik" was the appellation given to Lenin's branch of the Marxist Russian Social Democratic Party. At the 2nd Congress of the party in 1903, the party split into the *Bolshevik* (Russian for "majority") and the *Menshevik* (Russian for "minority") factions. The "February Revolution" refers to the revolution that occurred on 8 March 1917. Since Russia held to the Julian calendar until February 1918, all Russian dates were 13 days behind the West. "October Revolution" refers to the Bolshevik triumph on the night of 7/8 November 1917, but on 24 October under the Julian calendar. Although the Soviet Union commemorates the event as the "October Revolution," it is celebrated on November 8th.

to go along with its decrees. In short, the real locus of power was in the Soviet, but it refused to exercise it effectively.

The very first act of the Petrograd Soviet was the issuing of its notorious "Order No. 1" on 14 March, which authorized the election of soldier and sailor committees. The officers were by implication subordinate to the committees, even to the point of having to obtain their permission to issue arms. The rot of intense social conflict was injected into the armed forces at the very beginning of the Provisional Government's tenure, and the Bolsheviks' objective of destroying the "bourgeois" army, some nine million strong, was given a leg up at the very outset. In order to capitalize on "Order No. 1" the Bolsheviks immediately created a "Military Organization" to propagandize the troops. By July the "organization" had 26,000 agents and on the eve of the October Revolution the number had increased to around 50,000. It was not hard to sell the war-weary army of peasants in uniform on the desirability of peace and Kerensky's disastrous offensive in July plus the abortive coup of General Kornilov in September reduced confidence in the Kerensky regime to near zero by October.

The second objective, the creation of a Bolshevik-controlled military force was also successfully accomplished by October. The backbone of the force was the Red Guard, a factory militia, coming to around 20,000 in the Petrograd area. This Red Guard plus some 3,000 Baltic sailors stationed at Kronstadt and some Latvian rifles made up the Bolshevik striking force. It turned out to be large

enough to topple the Kerensky regime and to establish the new Bolshevik government.²⁰

When the Bolsheviks struck on the night of 6 November 1917, they had neutralized most of the military force nominally subordinate to Kerensky and had a small, but well-controlled, force of their own. The bewildered Provisional Government, holed up in the Winter Palace, finally threw in the sponge when Antonov-Ovseyenko led a storming party of sailors, soldiers, and Red Guards into the palace, and the cruiser *Aurora* rattled the windows by firing a few blank shots. The Kerensky regime seems to have had no roots, and the first determined revolutionary wind caused it to topple.

The events in Petrograd set off a train of Bolshevik revolts all over Russia. Sometimes the seizure of power, as in Moscow, was a difficult matter, but, on the whole, the job was accomplished with surprising ease. The Red Guard detachments had been organized in many industrial centers and even in some semi-industrial towns, and they proved adequate to the task of tumbling the local regimes. Once, however, both Moscow and Petrograd had fallen to the Bolsheviks, the heart and brain of Russia belonged to Lenin and his followers.

Organization of the Armed Forces. The new government, having successfully destroyed the regular armed forces of the Provisional Government, faced a Herculean task in forming a regular army to replace it. Until the signing of the Treaty of Brest-Litovsk on

²⁰For a more detailed description see K. R. Whiting, *The Development of the Soviet Armed Forces, 1917-1972*, Air University, Maxwell AFB, Alabama, 1972, pp. 9-11.

3 March 1918, the main threat came from the German forces; after the "peace" with the Germans, the Bolshevik regime faced the growing counter-revolutionary forces, referred to by the Communists as the White Guards, and the interventionist forces of the Allied powers (Britain, France, Japan and the United States). The victory so easily accomplished in the October Revolution was to be much more difficult to defend over the next three years, the years of the Civil War.

The newly created Soviet of People's Commissars, or *Sovnarkom* (*Soviet Narodnykh Komissarov*), which governed behind the facade of the All-Russian Congress of Soviets of Workers and Soldiers Deputies, created a People's Commissariat for Military Affairs to replace the now defunct Ministry of War.²¹ Its main job in 1917 was the demobilization of the old army and surveillance over the inherited materiel. On 20 December 1917, the All-Russian Collegium for the Organization of the Workers' and Peasants' Red Army came into being, sort of an executive arm of the People's Commissariat for Military Affairs.²²

In the meanwhile, the formation of local military organs called Commissariats for Military Affairs was encouraged, each headed by a *voenspets* flanked by two political commissars to keep him honest.²³

²¹*Dekrety Sovetskoy Vlasti* [Decrees of the Soviet Power], 3 Vols, Moscow, Moscow State Publishing House for Political Literature, 1957, Vol I, p. 20.

²²D. Fedotoff White, *The Growth of the Red Army*, Princeton, Princeton University Press, 1944, p. 32.

²³*Voenspets* was an acronym for "military specialist," or officers of the Tsarist Provisional Government armed forces who were recruited by fair means or foul to serve in the Red Army.

These local organs raised volunteer units and endeavored to supply them. Thus when the famous decree of the Sovnarkom on 28 January 1918 created the RKKA (*Raboche-Krest'yanskaya Krasnaya Armiya*), or Workers' and Peasants' Red Army, on a voluntary basis, in Fedotoff White's words it ". . . laid down the statutory basis for work already begun by local bodies. . . ."24

The volunteer system was not a howling success and on 29 May 1918 a decree of the Central Executive Committee (lineal ancestor of the present Council of Ministers, i.e. the executive branch of the government) instituted universal conscription in place of the voluntary system.²⁵ And on 8 July a Field Staff, headed by the Commander in Chief, was created as the central authority for the RKKA, followed on 2 September by the establishment of the Revolutionary Military Soviet, whose provenance was the coordination of all operational, administrative, and supply matters of the Red Army.²⁶ Finally, on 30 November 1918, the Soviet of Workers' and Peasants' Defense under Lenin was created to raise and organize the military forces of the new nation. Its powers in all matters pertaining to the mobilization of personnel and resources were enormous. But direct control of the RKKA and the Navy went to the Revolutionary Military Soviet, headed by Trotsky, the Commissar of War, and I. I. Vatsetis, the Supreme

²⁴*Op. cit.*, p. 40; for the decree itself, see *Dekrety Sovetskoy Vlasti*, Vol. I, pp. 356-57.

²⁵*Ibid.*, Vol. II, pp. 334-35.

²⁶White, *op. cit.*, pp. 38-39.

Commander in Chief.²⁷ Thus, as Fedotoff White points out, it took a full year to get the national defense machinery in order.

The air force, a relatively insignificant part of the overall Red military machine, received a lot less attention than the other elements of the RKKA and the Navy. On 10 November 1917 a board of commissars for aviation and aeronautics was established to administer the air fleet. It was to form aviation detachments, foster their growth, and train personnel. On 24 May 1918, the Central Administration of the Workers' and Peasants' Red Air Force was created to unify the air units throughout the country and, in August, the Field Administration of Aviation and Aeronautics of the Revolutionary Military Soviet, also known as *Aviadam*, was set up to direct the combat activities of all the Red Air Force units.²⁸

In the case of the Red Air Fleet, one has the impression that the administrative machinery was more impressive sounding than the force being administered. In November 1918 there were 38 detachments of indeterminate sizes and by early 1919 some 61 detachments had been formed, a total of around 350 combat-worthy aircraft on all fronts.²⁹

²⁷*Ibid.*, pp. 38-39; Vatsetis was a former Tsarist Colonel and a Latvian.

²⁸*Great Soviet Encyclopedia* (English translation of the Third Edition), Vol V, p. 16. The Soviet air force was referred to as the Red Air Fleet (*Krasnyy Vozdushnyy Flot*) between 1918 and 1924.

²⁹Figures for the number of combat-worthy planes in the Red Air Fleet in the early years of the Bolshevik regime are either varied and conflicting or else couched in vague terms about detachments or units with nothing to indicate the number aircraft per unit. For

Soviet Aviation in the Civil War (1918-1920). The new regime inherited not only a mixed bag of obsolete and worn-out aircraft, but also an aviation infrastructure that was even worse. The few aircraft factories and repair shops that managed to function at all lacked adequate machinery, spare parts, and skilled labor. Many of the engineers, technicians, and designers left the country when the Bolsheviks took over; others were shot out of hand by over-enthusiastic Red Guards or drunken Baltic sailors. The plethora of aircraft types making up the Red Air Force inventory did not help when it came to procuring or manufacturing parts.

According to one Soviet account, during the period of the Civil War (1918-20), the aviation factories and repair shops as a whole reconditioned 1,574 aircraft and 1,740 engines, and over the same span of time produced 650 new planes and 270 new engines.³⁰ Although such exact figures for a period of such confusion are hard to credit, they are all we have.

The shortage of fliers and mechanics was just as severe. Many

example, Simakov and Shipilov, *op. cit.*, p. 126, count 300 combat-worthy aircraft on 1 May 1918, while Erickson, *op. cit.*, p. 75, says there were 349 useable aircraft on 1 February 1919, but also points out that twice that number were in storage, some without engines. The authors of the *Great Soviet Encyclopedia* article on the Soviet Air Force in Vol V, p. 16, state that on the average, the number of combat-worthy aircraft on all fronts in the Civil War (1918-20) was 350. According to General-Major I. Kolesnichenko, in October 1917 the Russian Air Force had 96 aviation detachments of land aircraft and 36 of seaplanes . . . somewhat over 1,000 aircraft of various types, of which some 600 were in fair shape (*Sozdanie organov upravleniya Sovetskikh Voenno-Vozdushnykh Sil, 1917-1918gg.* [Creation of the Administrative Organs of the Soviet Air Forces, 1917-1918], *Voenno-Istoricheskiy Zhurnal* [Military-Historical Journal], No. 2, February 1976, p. 89).

³⁰ Simakov and Shipilov, *op. cit.*, p. 126.

fliers left the country, others joined the Whites, and some were simply shot out of hand or imprisoned. For example, the outstanding Russian ace in World War I, Kazakov, tells of how his agitated mechanic greeted him one day with the rumor that all officers were to be shot.³¹ With such Bolshevik encouragement as that it is not strange that Kazakov headed north to join the White air force working with the Anglo-American forces in the Murmansk-Arkhangel region.

The Bolsheviks set up quickie courses in the various air detachments to train pilots and mechanics. But a short while later they settled down to more thorough training programs in such institutions as the First Moscow Aviation School, the Petrograd Higher Military School, and the Moscow Aviation Technicum (later to become the prestigious Institute for Engineers of the Red Air Force). Simakov and Shipilov state that during the Civil War the aviation schools turned out 1,110 fliers and 250 observers.³²

Another perennial problem for the newly fledged Red Air Force during the Civil War was the lack of decent aviation fuel and lubricants. The oil fields of Baku and the northern Caucasus were either controlled by the British or the Whites, or hostile armies lay athwart the routes to the oil fields. So in place of gasoline the Soviet pilots had to fill their tanks with a weird concoction known as the "Kazan' blend," with alcohol, or with kerosene.

³¹Nowarra and Duval, *op. cit.*, p. 53.

³²*Op. cit.*, pp. 132-133.

What these ersatz "gasolines" were like can be gleaned from the vivid description of one of the fliers, who wrote:

The "blend" burns badly, it gives off a mass of soot, it diffuses such a suffocating stench that after an hour flight the pilot has a headache and after the mission he is sick. It was especially risky to fly on kerosene in the winter. If after take-off, you should make an average turn, then it was impossible to change course for any reason--the engine floods and stops. . . . Raw spirits as a fuel was worse than either the Kazan' blend or kerosene. It burned badly in the winter and it always contained water however carefully the plane was fueled. After a flight in a plane fueled with raw spirits, the flier had a splitting headache.³³

Trotsky, in a message sent from Petrograd, during the Yudenich assault, to Lenin in Moscow on 24 October 1919, complains about the quantity and quality of aviation fuel:

Aircraft, especially naval aircraft, could play a major role if supplied with decent fuel. It appears that the Eleventh Army has two thousand puds [72,000 lbs.] of fuel at its disposal. Three hundred puds [10,800 lbs.] should be dispatched to Petrograd.³⁴

Given the antiquated aircraft, the lack of repair facilities and spare parts, plus the shortage of adequate POL, it is small wonder that the Red Air Force performed so shabbily. The wonder is that it could perform at all.

One of the hostile air forces facing the Reds in mid-1918 was that of the Anglo-American interventionists in the Murmansk-Arkhangelsk region. The embryonic Red Air Force tangled with the British planes on occasion, but it was more like a token resistance since the Soviet

³³I. U. Pavlov, *Boevoy Put'* (Combat Way), Moscow, Molodaya Gvardiya, 1938, pp. 140-41.

³⁴Meijer, *The Trotsky Papers*, pp. 729-31.

machines were no match for the deHavillands, Sopwith Camels, and Fairey IIIs of the Anglo-American North Russian Expeditionary Force. The Expeditionary Force probably had in the neighborhood of a hundred aircraft at that time.

In the summer and fall of 1918, the city of Tsarisyn (later named Stalingrad and still later renamed Volgograd) came under White attack. The city, a key point on the food and petroleum supply route from the Caspian Sea, was hotly defended by the Reds. But the only air support the Red Army command could allot was one air detachment of six reconnaissance and two fighter planes. These supplied air intelligence, did some bombing, acted as artillery spotters, and, in their spare time, strafed the enemy ground forces.

Between June and September 1918, a key battle took place over possession of the city of Kazan'. The Czech Corps, made up of Czech and Slovak prisoners of war who had volunteered to fight the Germans, some 35,000 men in all, had been promised transport to Vladivostok so that they could embark from there for Western Europe in order to resume their struggle with the Germans. While the various elements of the Corps were strung out over the length of the Trans-Siberian Railroad, relations with the Bolsheviks turned sour and they revolted, throwing in their lot with the White forces in the Volga River valley and in Siberia. The Czechs with the Whites took Kazan'.

Trotsky, the Commissar of War, sped to Sviyazhsk, a little town across the river from Kazan', and performed miracles in restoring discipline and morale in a badly demoralized Red Army. By September

the Reds recaptured the city and thus blunted the threat to Moscow.

Soviet historians tend to give glowing accounts of the role of aviation in the battle for Kazan', pointing out that the newly created 1st Soviet Combat Aviation Group, made up of the best fliers and mechanics in Moscow, attacked the city on 30 June and for the first time Soviet aviation used combat flights of 10 to 20 aircraft in a systematic bombing of Kazan'. Altogether in the August-September phase of the battle, the 1st Aviation Group carried out 300 sorties, flew over 300 hours, and dropped around 1,600 kilograms of bombs [3,500 lbs.].³⁵

Trotsky, reporting to Moscow from Sviyazhsk on 15 August, seemed somewhat less laudatory, but probably more accurate: "We have concentrated substantial forces of aviation here, which are terrorizing bourgeois Kazan' by dropping large quantities of dynamite on it. Air intelligence has started to yield fruitful results."³⁶

The year 1919 was the decisive year in the Civil War. During 1918, White armies had been built up around the periphery of European Russia; Kolchak, the "Supreme Ruler," although pushed out of the Volga area in late 1918, still had a formidable force based on the Urals and Western Siberia. Denikin's Volunteer Army, allied with the Don and Kuban Cossacks, was reaching sizeable proportions in the south of Russia. General Evgeny Miller, supported by a small Allied

³⁵Simakov and Shipilov, *op. cit.*, p. 137.

³⁶Meijer, *op. cit.*, p. 81.

force in Archangel, was an incipient threat to the Bolsheviks' northern flank, while in the Baltic region, chiefly around Estonia, General Nikolai Nicholaevich Yudenich was building up a White force capable of threatening Petrograd and Soviet access to the Baltic.

With the Germans out of the war, the Allies were in a quandary about their role in the Russian Civil War. Earlier Allied intervention in Murmansk (March 1918), Archangel (August 1918) and Vladivostok (August 1918) was under the guise of protecting munitions stored in those three areas and of preventing German and Austro-Hungarian prisoners of war in Russia from being armed and carrying the war into the Russian rear. As early as December 1917, the British and French had agreed to spheres of operations in Russia: the British were to work in the Cossack areas of the Don and the Kuban as well as in the Caucasus, while the French were allotted Bessarabia, the Ukraine, and the Crimea. In addition, the British were supplying Yudenich in Estonia and Miller at Archangel. In April, the Japanese landed forces in Vladivostok to do a little fishing in the troubled waters of East Siberia and Manchuria.

The four major White armies, capable of driving in toward Moscow from the four points of the compass, never succeeded in synchronizing their efforts. For one thing, they had difficulty in communicating with each other. Louis Fischer, points out that Denikin's telegram to Kolchak, announcing his willingness to subordinate himself to the supreme ruler's command, left Ekaterinodar on 30 May 1919, went through Constantinople and other way points, and finally reached Omsk on

20 June.³⁷ It is hard to conceive of any tightly coordinated effort with communications of that order. However, even with poor communications, the White leaders did an extremely poor job of supporting each other.

Kolchak's forces opened the 1919 campaign, and, in March and April, had some successes, especially on the northern, or right wing, and reached Glazov, midway between Perm and Vyatka. If Miller's forces from Archangel had ever left home and had joined Kolchak's northern wing, the Bolsheviks would have been hard pressed to protect Moscow. Considering the paucity of Miller's forces, however, Kolchak should have been putting his best efforts into pushing southwest to link up with Denikin's right wing instead of frittering his time away in the north. But the admiral was no great shakes of a strategist. By July, the Kolchak forces had begun to crumble, and the Reds were pushing well into the Urals. A White attempt to outflank the Reds at Chelyabinsk resulted in a severe defeat and 15,000 White prisoners. In early November, the Reds took Omsk and the campaign was pretty much over with, although the Reds pushed on toward Lake Baykal. On 15 January 1920, Kolchak put himself under Allied protection, but the French commander, General Janin, and the Czechs handed him over to the Reds. After a prolonged interrogation, they shot him on 7 February and stuffed his body in an ice-hole in the Angara River, thus ending the White hopes in Siberia.

³⁷*The Soviets in World Affairs*, 2 Vols, Princeton, New Jersey, Princeton University Press, 1951, Vol 1, p. 201.

In May, about the time Kolchak's armies were running out of steam, Denikin launched an offensive from the south. The Whites quickly overran the Donets Basin, captured Kharkov and Tsaritsyn (later Stalingrad and now Volgograd) at the end of June, and began a three-pronged offensive against Moscow. By October, the Whites were in Chernigov in the Ukraine and in Orel on the Moscow front. Orel is only 250 miles from Moscow and the Soviet leaders were nearly in a state of panic. To make matters worse, on 17 October, Yudenich began a drive toward Petrograd, thus putting both the former and present capitals in danger.

Denikin's logistics were stretched to the breaking point; he had no reserves left; and Red partisans and peasant guerrillas were harassing his rear. When the Red Army counterattacked in late October, the Whites were rapidly defeated. They fell back, in many cases less in retreat than in a rout and, by the end of the year, were fighting for their lives in the Kuban and Caucasus area. By January 1920, Denikin was penned in at Novorossisk and succeeded in getting only part of his forces to the Crimea by sea.

Yudenich, racing from Yamburg to the outskirts of Petrograd (some 100 miles away) between 11 and 16 October, was finally halted at Pulkovo, at the city limits of Petrograd. Trotsky himself had gone to Petrograd to direct the defense and was successful. In early November, Yudenich, threatened on his flank by the 15th Red Army, had to retreat to Estonia, where his army was disarmed and interned by the new Estonian government. In a little over a month (11 October to 14 November),

Yudenich had blitzed his way to Petrograd, had been held at the outskirts, and then had been driven back to his starting point.

By the end of 1919, the Bolsheviks were victorious on all fronts, and the only viable army the Whites had left was the remnants of Denikin's forces that had made it back to the Crimea. The early defeat of Kolchak allowed the Reds to concentrate their forces against the far more formidable Denikin. The inability of Denikin and Kolchak to link forces at the Volga, the paucity of Yudenich's forces (less than 20,000 men), and the immobility of Miller in the north resulted in making the Bolshevik advantage of inner lines of communications of the utmost value. They were able to shift troops and commanders from front to front as the White attacks developed one by one instead of all together.

The role of aviation in the drama of 1919 was, to put it mildly, not very decisive. But it did play a part, if only a minor one. In the battle with the Kolchak forces on the Eastern Front in the spring and summer of 1919, the Red command managed to scrape together 17 air detachments with a combined total of around a hundred planes. This force carried out 800 sorties and dropped about 10,000 lbs. of bombs.³⁸ Its greatest value, however, was in reconnaissance. The enormous size of the combat theater and the relatively small forces engaged meant that good air intelligence was an invaluable asset.

³⁸Simakov and Shipilov, *op. cit.*, pp. 140-42.

In the campaign against Denikin and his 200,000-man army in the summer and fall of 1919, the Reds initially were able to muster 23 air detachments with a total of 140 aircraft, many of them in very bad shape. Spare parts and POL supplies were in unusually short supply, which meant "awful" since "usual" signified "bad." The most valuable contribution of the air force was its effectiveness against Mamontov's cavalry, mostly Cossacks. The White cavalry managed to get around the Southern Front of the Reds and to attack from the rear. At this point the Reds created a special group of aviation made up of 17 aircraft, two of which were "Il'ya Muromets" bombers. The special group was an elite force recruited from flying instructors and mechanics of the best aviation schools in Moscow. It was successful in disrupting Mamontov's cavalry since air attack at low level against cavalry in the open plains of European Russia is something akin to shooting fish in a barrel.

By October the Reds had 29 air detachments with 170 planes on the Southern Front and during October and November the tiny air force flew 400 combat missions. During the entire campaign against Denikin the Red pilots flew 1,666 missions and dropped over 5,000 lbs. of bombs.³⁹

The perceptive reader will have noticed that there is hardly any mention of air-to-air combat in this account of the Civil War. For example, Soviet sources credit Denikin with over 180 planes versus

³⁹ *Ibid.*, pp. 145-52.

the 140 to 170 aircraft of the Reds, which would seem to provide the materiel for plenty of dog fights. But the theater was so vast that the few planes flying at any one time were not likely to run into each other. So they mostly stuck to their main tasks of flying reconnaissance, providing close support for the ground forces, and doing liaison work to keep the widely scattered armies in some kind of communication with each other.

Just as the Denikin threat was peaking out in October, Yudenich began his dash for Petrograd. British assistance for Yudenich was hardly overwhelming and was especially niggardly in aircraft and gasoline. Yudenich was so short of fuel for his sixty or so trucks and his few aircraft that he even appealed to Hoover's American Relief Mission for 50,000 gallons of gas.⁴⁰ The Reds had 35 land-based aircraft and 27 naval sea-planes, which were combined into a single outfit under one commander. Just how much this little force contributed to Yudenich's defeat is impossible to evaluate--but probably little. One authority, however, maintains that the fifty or so Red aircraft opposing Yudenich, although only using 50-lb. fragmentation bombs, might seem puny by World War II standards, but for 1919 it was "quite a respectable concentration of air power."⁴¹

By the end of the year the Bolsheviks had succeeded in repelling

⁴⁰George Stewart, *The White Armies of Russia*, New York, Macmillan, 1933, p. 226.

⁴¹George Schatunowski, "The Civil War to the Second World War," in Asher Lee (editor), *The Soviet Air and Rocket Forces*, New York, Praeger, 1959, pp. 23-24.

the White onslaughts; Kolchak was on the run in far Siberia, Denikin had been pushed into the Crimea, Yudenich was out of the war, and Miller never got started. Whatever role the Red Air Force played was greatly helped by the Red command's strategy of concentrating its air power on the most threatened of the fronts and, in possession of the inner lines of communications, it was able to transfer planes and repair equipment by rail from one front to another. For example, many of the planes and pilots who opposed Denikin in October 1919 had been engaged in the campaign against Kolchak just a few weeks or months before.

Nineteen hundred and twenty brought new problems for Lenin and his colleagues. The remnants of Denikin's forces were rehabilitated by General Pyotr N. Wrangel', who succeeded Denikin in April 1920. And early in 1920, Polish forces under the command of General Joseph Pilsudski pushed into the Ukraine and took Kiev in May.

The Poles were put on the defensive shortly after the seizure of Kiev, and, on 14 May, Tukhachevsky (then only 27 years old) began a counterattack on the northern wing of the Poles. By early July, the Red Army had pushed the Poles back to the Bug and Narew rivers, the last barriers protecting Warsaw. On 1 August, the Reds breached the Bug barrier and entered ethnographic Poland. The Bolsheviks were elated. They were now expanding the revolution on the bayonets of the Red Army--even the usually cautious Lenin began to visualize the Red Army bolstering the German comrades and a Red Europe swiftly coming into being. Only Trotsky was against the idea of pushing into Poland.

In the meanwhile, Budenny's Cavalry Army (16,000 mounted men, 48 guns, 5 armored trains, and 12 aircraft) was moving toward Warsaw from the south. When his right wing connected with Tukhachevsky's left, the grand assault on Warsaw, it was thought, would be irresistible and would bring the "bourgeois" Polish government tumbling down. But Budenny's army, whose political advisor was Stalin, never did close the gap between it and Tukhachevsky's forces to the north, a gap held by the so-called "Mozir Group" of only 6,000 men. Instead, Budenny and Stalin attacked Lvov and got tied up in a conflict irrelevant to the main campaign.

Pilsudski, his back to the wall at Warsaw but helped considerably by a group of French military advisors headed by General Weygand, decided on 16 August to strike out at the gap held by the "Mozir Group" and then turn north, thus hitting Tukhachevsky's forces in the flank and rear. He was unbelievably successful and the Red retreat was almost a rout. The first attempt of the Bolsheviks to penetrate Western Europe by armed forces was a catastrophe.

In later years, Tukhachevsky was in the habit of pointing out the asininity of Stalin's attempt to run his own Polish campaign, largely based on the fallacious assumption that the Polish workers would flock to the Red banner. This did little to increase Stalin's affection for Tukhachevsky, and the ruthless Georgian had his revenge during the Great Purge of 1937.

The diminution of full-scale fighting on the Polish front gave the Reds a chance to shift their main effort against Wrangel's forces

on the southern front, where the Whites had moved dangerously deep into Soviet territory. In September, Mikhail Frunze was given the overall command of the Red Army opposing Wrangel, and, by November, the Whites were driven into the Crimea again. At that point, the Reds faced the allegedly impossible barrier of the Perekop, the well-fortified narrow neck of the isthmus connecting the Crimea with the mainland. Blyukher, a brilliant Red commander, led his 51st division in a breakthrough of the Perekop, and the Civil War was over. Wrangel did manage to get most of his men out of the Crimea by ship, and they went into exile.

In utilizing air power against the Poles in 1920, the Red command tried to form their squadrons with a single type of plane and engine in an effort to facilitate repairs and the supply of spare parts. The command also concentrated 70 percent of its available aircraft on the Polish front. According to Simakov and Shipilov, the Soviet pilots flew over 2,000 missions and dropped over 14,000 lbs. of bombs. They also downed 35 enemy aircraft, evidence of an upturn in air-to-air combat in that theater--if you can believe the claim.⁴²

In the campaign against Wrangel in late 1920, the Red Air Force used the experience gained in defeating Mamontov's cavalry to do the same to Wrangel's. The first *Shturmovik* air unit of about 40 planes was formed for this purpose.⁴³ The Red Air Force outnumbered Wrangel's

⁴²*Op. cit.*, pp. 152-58.

⁴³Schatunowski, *loc. cit.*, p. 24. *Shturmovik* (from *shturm* meaning "storm" or "assault"), became the Soviet designation for strike aircraft, for dive bombers.

few obsolete aircraft by a wide margin and Soviet air power was a much more important ingredient in the victory over the Whites in the Crimea. As Schatunowski points out, "the last half of the 12,000 sorties carried out by the Soviet Air Force in the Civil War period were much more effective than the operations of the first half."⁴⁴

3. THE NEP PERIOD (1921-28)--THE TEETHING STAGE OF SOVIET AVIATION

With characteristic doctrinal flexibility, Lenin came forth with his New Economic Policy (NEP) in March 1921. The new policy was a tacit admission that the bourgeois revolution had been far from completed by October 1917 and that a great deal of economic development was needed before the Soviet state could attain socialism. Some of the faithful complained that this was ideological treason, a capitulation to the bourgeoisie. Lenin retorted that it was only a tactical retreat, and, as long as the state held the "commanding heights"--namely, a monopoly in banking, international trade, transportation, and heavy industry, the revolution was safe. This was a breathing spell after the frenzied exertions of the last four years. It was a form of "coexistence" with the petty bourgeoisie and the peasant. But the evidence seems conclusive that Lenin intended the NEP to last for some time.

Under the new policy, retail trade and small manufacturing plants were left to private enterprise. The peasant was taxed at a fixed rate in kind, but he was allowed to dispose of any surplus at competitive prices in the open market. Between 1921 and 1928, the Russian

⁴⁴*Ibid.*

economy recovered to a remarkable degree.

The new regime, as befitted a government that prided itself on its scientific outlook, was air-minded. As early as December 1918, Lenin helped Professor Nikolay Yevgorovich Zhukovsky establish an institution devoted to research and development in aeronautics, the famous TsAGI (*Tsentral'nyy aero-gidrodinamicheskiy institut*), the Central Institute for Aerodynamics and Hydrodynamics. Zhukovsky managed to collect a cadre of outstanding aeronautical experts, including such men as Tupolev, Mikulin, Kalinin, and Grigorovich.⁴⁵ Zhukovsky also founded a Soviet Air Technical School in Moscow which was subsequently named the Zhukovsky Military Air Academy and is now one of the outstanding educational and research institutions in the USSR.

But air-mindedness alone could not overcome the two great lacks of an adequate industrial base and trained personnel. As late as 1923-1924, Soviet aviation was little better off than in 1918, since it still had between 300 and 400 obsolete aircraft of 32 different types, mostly foreign, few pilots, and little in the way of training facilities. Frunze did establish the VVS (*Voennno-vozdushnye sily*), the Air Force, as a semi-independent service in 1924 and thereby removed it from the complete domination of the ground-force oriented thinking of most of the high-ranking military leaders.

⁴⁵Later, the work of TsAGI was supplemented by other institutions, the outstanding of which were TsIAM (*Tsentral'nyy nauchno-issledovatel'skiy institut aviamotorstroeniya*), the Central Scientific Research Institute of Aircraft Engines, and VIAM (*Vsesoyuznyy nauchno-issledovatel'skiy institut aviatsionnykh materialov*), All-Union Scientific Research Institute of Aviation Materials.

The Soviets Build Their Own Aircraft. During the decade of the 1920s, Soviet aircraft and engine designers worked assiduously at the development of indigenous products. One of the first planes built at TsAGI was Tupolev's light, single-seat, low-wing monoplane powered by a 45 hp Anzani engine and called the ANT-1.⁴⁶ The development of a new alloy ("kol'chugalyuminyy") made it possible for Tupolev to design a mixed wood and metal airframe considerably lighter than heretofore. In 1924 he came up with ANT-2, a single-engine transport closely resembling the Junkers K.16. It was the first Soviet all-metal aircraft, having a corrugated kol'chugalyuminyy skin. It was powered by a 100 hp engine and could attain a top speed of 100 mph.⁴⁷ And in 1925 Tupolev designed his ANT-3, a two-place sesquiplane powered by an M-5 450 hp engine (the Russian copy of the Liberty). In its military version it was labeled the R-3 and had a top speed of nearly 200 mph.

Tupolev, although even then most prolific, did not have a monopoly

⁴⁶ANT stood for the initials of the designer, Andrey Nikolayevich Tupolev and the figure "1" denoted his first aircraft. But most Soviet aircraft, even in the 1920s, had designations that indicated what type they were and whether they were the designer's first, second, or whatever. For example, the Polikarpov I-2: the "I" standing for *Istrebitel'* (fighter or pursuit) and the "2" indicating that it was his second design. "R" stood for *Razvedchik* (reconnaissance), TB for *Tyazhyolyy bombardirovshchik* (heavy bomber), SB for *Skorostnoy bombardirovshchik* (fast bomber), and *Dal'nyy bombardirovshchik* (long-range bomber).

⁴⁷*Aviatsiya i Kosmonavtika* (Aviation and Cosmonautics), No. 6 (June 1973). This is the official journal of the Soviet Air Forces. Beginning in June 1973 there was a series of articles which listed the main characteristics of Soviet aircraft right from the early 1920s along with a small picture of each. The series included experimental as well as those aircraft that went into service. The series is entitled "Samolyoty SSSR" (Aircraft of the USSR). In *Aviatsiya i Kosmonavtika*,

on new aircraft. Aleksandrov and Kalinin in 1924 produced the popular AK-1, a three-place single-engine passenger plane which for some reason got the nickname of "Latvian Rifleman" (*Latyshkiy strellok*). It had a top speed of 90 mph. In that same time period, Nikolay N. Polikarpov was beginning his illustrious career as an aircraft designer. In 1923 he produced his I-400 (the 400 standing for the horsepower of its M-5/Liberty engine), a low-wing fighter. With some improvements it was re-designated the Il-M5 and went into series production in 1925.

Not all of the new models were strictly of Russian vintage. The R-1 was a Russian copy of the De Havilland 9A powered by a Russian copy of the Liberty engine. It was a popular aircraft and 2,860 of them were produced.⁴⁸ In 1925 six of the new aircraft--one AK-1, two R-1s, and one R-2, a Krylov-designed biplane--flew from Moscow to Peking. They were, however, accompanied by two Junker passenger planes.

Between 1920 and 1928 Soviet aircraft designers turned out about forty types of planes, including experimental as well as those which went into production. One of the experimental jobs was a four-winger!

No. 4 (April 1974), pp. 20-22, there is an article by Tupolev's son, A. A. Tupolev, in which he describes the importance of both duralumin and his father's ANT-2 in the history of Soviet aviation. He quotes Andrey Nikolaevich as saying: "The day of the birth of *Kol'chugalyuminyy* became the day of the birth of our design bureau and experimental plant." (p. 21) The Soviets named their first duralumin *kol'chugalyuminyy* in honor of the plant, the Kol'chuginskiy Copper-Rolling Plant, in which it was first produced.

⁴⁸Nowarra and Duval, *op. cit.*, p. 59.

About twenty of the aircraft types went into serial output, however, which was not a bad showing for a country which was in the process of trying to tidy up the mess left by six years of continuous war.

Dmitry P. Grigorovich, designer par excellence of seaplanes, eight different ones between 1914 and 1917, tried his hand at producing a land-based fighter, the I-2 in 1924. When it did not sell, he tinkered around with it and in the next year came up with the I-2bis, which was accepted for serial production. It was a single-engine (400 hp) biplane with a top speed of 140 mph. Two years later, Tupolev came out with an all-metal single-engine, single-seater fighter, the ANT-5 or I-4. It had an M-22 (420 hp) engine and its top speed was 150 mph. A total of 369 I-4s were built.⁴⁹

Most of the aircraft produced in the 1920s were either reconnaissance or fighter planes. Tupolev, however, did provide a reasonably good bomber for its time, the ANT-4 or TB-1. It was a twin-engine all-metal monoplane which could carry about a ton of bombs and was armed with three machine-guns. The early models were powered by German 450 hp BMW engines, but later models had Russian M-17 engines. This bomber had a top speed of around 120 mph.⁵⁰

Two other early aircraft should be mentioned: the two most widely used trainers, the U-1 and the U-2. In 1919 the Reds shot down a

⁴⁹*Ibid.*, No. 8 (August 1973), pp. 28-29.

⁵⁰*Ibid.*, for an almost outrageously enthusiastic description of the TB-1, see Simakov and Shipilov, *op. cit.*, pp. 174-76.

British AVRO-504K and managed to salvage enough of it to enable the Duks plant in Petrograd to duplicate it. Serial production began in 1922 under the appellation of U-1 (the "U" standing for "primary trainer"), although it soon got the nickname of "Avrushka." This single-engine (120 hp) biplane with a top speed of 85 mph was the standard primary trainer between 1922 and 1932.⁵¹ Polikarpov, in 1927, designed a trainer also and a year later an improved version of his original model went into production under the designation of U-2. A biplane with a 100 hp engine, top speed of 95 mph, it had great flying characteristics. It was even used in World War II as a night bomber. In 1944 the designation was changed to Po-2. According to Nowarra and Duval, up to the end of the 1960s some 40,000 U-2/Po-2 aircraft had been turned out which they regard as some kind of a world record.⁵²

The German Connection. The Soviet regime throughout the 1920s was able to get some support from the Germans in the training of personnel and in the development of air tactics as the result of the strange collaboration between the Red Army and the *Reichswehr*. The idea of some kind of a mutually beneficial relationship between the two armies seems to have arisen almost immediately after the cessation of Russian-German hostilities. Both were anti-Versailles, a treaty that sought to emasculate the German military and to quarantine the Soviet regime behind a *cordon sanitaire*. In addition, the

⁵¹Nowarra and Duval, *op. cit.*, p. 60; *Aviatsiya i Kosmonavtika*, No. 6(June 1973).

⁵²*Op. cit.*, p. 78.

fear of the newly created Poland, established at the expense of both Germany and Russia, was in itself a *raison d'etre* for some type of collaboration.

Karl Radek, while imprisoned in Germany, held conferences during 1919 with a number of highly placed Germans about a closer German-Soviet relationship. When he left Germany in 1920, the seed was well planted and Hans von Seeckt, commander of the new *Reichswehr*, opted for an *Ostpolitik* to offset the Versailles powers and organized a secret group (*Sondergruppe R*) to look into the matter of collaboration with the Red Army. Trotsky, Commissar of war, showed an interest in the scheme, since it would mean German military-industrial assistance in the rebuilding of his badly rundown Red Army. As a result a German technological mission was invited to come to Moscow. The negotiations resulted in an agreement under which the Junkers company was to build a plant at Fili, a Moscow suburb, to manufacture all-metal aircraft, spare parts, and engines. This part of the collaboration petered out by 1925, largely because of German monetary difficulties. The Russians, however, did inherit a modern plant for their burgeoning aircraft industry.

The personnel training side of the strange relationship was much more successful. As early as February 1922 Radek, in a conference with von Seeckt, suggested that the *Reichswehr* assist in training senior Red Army officers, and the Treaty of Rapallo in April 1922 greased the way for just such a step. A provisional agreement of August 1922 showed the German desires: military bases in the Soviet

Union on which to carry out aircraft exercises, motorized troop maneuvers, and the training of chemical warfare forces, as well as the exchange of technical information with the Red Army.

The mutually advantageous arrangements worked out well. During the 1926-33 period, around 120 senior Red Army officers received training in Germany with the *Reichswehr*, some of them in the secret General Staff course which had been forbidden by the Treaty of Versailles. In return the *Reichswehr*, severely restricted by the treaty of Versailles, found space and security in the Soviet Union to develop and experiment with the forbidden weapon systems, especially with aircraft. By 1924 an airforce training field was set up at Lipetsk, about 150 miles south of Moscow, with 60 German instructors and 100 technicians. Regular flying training began in 1925. The German and Russian flying staffs and technical personnel worked closely together; the Soviet ground crews underwent training under German instructors and the Soviet fliers learned their trade from their German counterparts. The whole business was camouflaged under the rubric of "No. 4 Squadron of the Red Air Force." Although the Russian-German collaboration included a tank school at Kazan' and a poison-gas school at Volsk, neither of which worked out very well, it was at Lipetsk that the joint endeavor proved profitable for both. One reason was that the creation of the aviation field at Lipetsk coincided with an almost desperate Soviet effort to develop military aviation.⁵³

⁵³For more details on this important collaboration see Robert A. Kilmarx, *A History of Soviet Air Power*, New York, Praeger, 1962, pp. 70-74; John Erickson, *The Soviet High Command*, New York, St. Martin's Press, 1962, pp. 144-163; and Walter Schwabedissen, *The Russian Air Force in the Eyes of German Commanders*, USAF Historical Division,

Paramilitary Organizations to the Rescue. The Soviet Union inherited a technologically illiterate population in 1917, and no nation can become a modern military power in the twentieth century without a reservoir of manpower that has some conception of the tools of modern warfare. During the 1920s and 1930s, the Soviet leaders depended to a large extent on paramilitary societies to train the youth in the fundamentals of handling technological equipment, and, on the whole, these extra-military agencies did a good job.

In 1920, there was formed a Military-Scientific Society (VNO) for the purpose of augmenting the military knowledge of the Red Army personnel, especially its commanders, in 1923, a Society of Friends of the Air Fleet (ODVF) came into existence, and the slogan of "Working people, build an Air Fleet" helped to raise funds for aviation.⁵⁴ This was followed by the creation of a Society of Friends of Chemical Defense and Chemical Industry (Dobrokhim). ODVF and Dobrokhim united in 1925 and formed the Society of Friends of Aviation, Chemical Defense, and Chemical Build-up of the USSR (Aviakhim). In 1926, the VNO changed its name to the Society for Assistance in Defense (OSO), and, on 23 January 1927, the two defense societies, Aviakhim and OSO were merged into the unified Osoaviakhim, the Society for Assistance in

Research Studies Institute, Air University, 1960, pp. 1-4.

⁵⁴ Between March 1923 and early 1925, ODVF's membership went from zero to three million and in that same period it collected and spent on the Soviet Air Forces about one and half million rubles for 150 aircraft and the equipment, such as hangars, for 20 airfields. Simakov and Shipilov, *op. cit.*, pp. 185-86.

Defense and for the Aviation-Chemical Build-up of the USSR. This organization, at the suggestion of Voroshilov, was taken over by the government and lost its "voluntary" status.

In spite of its long and solemn-sounding name, Osoaviakhim really had a direct and simple goal: the training of young Soviet citizens in the technological side of military life, especially in aeronautics and communications. Many millions of young Soviets, male and female, underwent training in the clubhouses of Osoaviakhim, learning about engines, airframes, radio, motor transport, and even parachute jumping. These things, so taken for granted in a modernized society, were mysteries to the sons and daughters of the average *muzhik* before their entry into Osoaviakhim. The organization made many a Soviet youth technologically literate before his induction into the armed forces.⁵⁵

⁵⁵For details, see Kenneth R. Whiting, "Soviet Civil and Paramilitary Air Power," in Eugene M. Emme (editor), *The Impact of Air Power*, New York, Van Nostrand, 1959, pp. 582 ff.

CHAPTER II

STALIN BUILDS A MODERN AIR FORCE

By October 1923, the multi-million-man Red Army had been reduced to 566,517 regular troops. The manpower cuts had been largely motivated by economic necessity, and the intention was to supplement the tiny Red Army regular force with large territorial-militia forces. However, peasant riots throughout the country in the wake of the Civil War slowed down any precipitous implementation of the territorial-militia plan--the last place in the world to put guns at that time was in the hands of a badly disgruntled peasantry. So it was not until 1923 that things had quieted down enough in the countryside to permit a start on the implementation of the territorial-militia program.

In 1924 and early 1925, the pro-Stalinist leaders in the Red Army worked hard to oust Trotsky from his job as Commissar of War. However, when Mikhail V. Frunze did get the job, the Stalinists found him hard to handle and upon his death in October 1925, Stalin promptly gave the job to his faithful servitor, Kliment Ye. Voroshilov, an old Civil War buddy. Voroshilov assured Stalinist control over the Armed Forces. The brains of the General Staff of the Red Army resided in Voroshilov's deputy, Mikhail N. Tukhachevsky, one of the outstanding generals in the Civil War and still only 33 years old in 1925.

Stalin, his Commissar of War, Voroshilov, Tukhachevsky, and other

military leaders were extremely dissatisfied with the cadre-militia Red Army, especially with the lack of modern weapons. The Soviet Air Force was both small and equipped with a mixed bag of foreign-made and obsolete aircraft. The artillery was armed with guns of all calibers and was perennially short of shells. Although Voroshilov and Tukhachevsky were interested in tanks and armored vehicles, there were few of them in the Red Army, and that few were outmoded. A burning desire to eliminate the militia in favor of a large standing army and longing for the weapons necessary to modernize the army, however, could lead to little until the Soviet industrial base had been greatly enlarged.

4. BUILDING THE MILITARY-INDUSTRIAL COMPLEX

In October 1928, Stalin announced the First Five-Year Plan, probably the most important date in the history of the Soviet Union except for 7 November 1917. It has been called the Second Revolution, the conscious attempt to speed up the creation of the productive base in order to equip and maintain a modern military force. Frunze could not have asked for more in the integration of military needs and economic planning.

The extreme emphasis on heavy industrial growth imposed grievous burdens on the Soviet people. The production of consumer goods lagged increasingly behind that of capital goods, and the peasants were forced into the strait jacket of collectivization. But the Plan was carried out ruthlessly. The Soviet Union would be industrially self-sufficient and the Red Army bigger and better armed in the shortest

time possible even if there were fewer Russians to enjoy the security thereby attained.

Some idea of the tempo of this rush into industrialization can be gleaned from the rate of increase in steel production, a basic input in the production of armaments. In 1919-1920, the output of pig iron dropped to the unbelievably low figure of 115,000 tons. It was not until 1929 that the 1913 level of four million tons a year was again attained. In this period, steel imports were high, especially special steels for military production. By the end of the First Five-Year Plan (1932), Soviet steel production was up to 6½ million tons a year, and, by 1937, it had risen to almost 20 million tons a year.¹ At this point, the Soviet Union was almost self-sufficient in steel, importing less than one percent of its needs.

At the beginning of the First Five-Year Plan in 1929, the Red Army was in a parlous condition as pointed out in the following passage from an official Soviet history:

. . . Up to this time our army was significantly backward in the quantity and quality in armaments and military technology compared to the armies of the strong bourgeois nations because of the economic backwardness of the country inherited from Tsarist Russia.

Arms and combat techniques were little advanced over the technology of the First World War. There was an absolute insufficiency of weapons. In 1929 the entire Red Army had around 26 thousand machine guns, 7 thousand guns of various calibers, 200 tanks and armored vehicles, and one thousand

¹*Narodnoe khozyaystvo v 1958 godu* (The National Economy of the USSR in 1958). Moscow, Gosudarstvennoe Statisticheskoe Izdatel'stvo, 1959, p. 158.

combat aircraft of old construction. Aviation, armored and technical personnel made up only ten percent of the Armed Forces of the USSR.²

As a result of the rapid growth in heavy industry, especially in those branches most closely associated with armaments, the Red Army began to get the arms and equipment so necessary for any serious efforts at modernization.

The costs of this modernization at a forced tempo included the collectivization of agriculture literally at bayonet-point, the strict rationing, or even non-production, of consumer goods, and Draconian labor discipline in the industrial sector. The other ingredient in the Stalin model for economic development was *total planning*, the control of inputs and outputs of the entire economy by the central organs in Moscow.

The heart of this total planning was Gosplan. The economists of Gosplan drew up quarterly, annual, and five-year schedules, and also supervised their fulfilment. A Gosplan quota had the force of law: overfulfilment meant rewards, while underfulfilment carried drastic penalties. To a large extent the success or failure of Stalin's forced industrialization hinged on the ability of Gosplan to synchronize the economy effectively.

By the early 1930s, the Soviet economic model was fully developed: the inflexible goal was the rapid development of heavy industry; the

²*Istoriya velikoy otechestvennoy vojny Sovetskogo Soyuza 1941-1945.* (The History of the Great Fatherland War of the Soviet Union, 1941-1945) Moscow, Voennoe Izdatel'stvo Ministerstva Oborony Soyuza SSR, 1960, Vol 1, p. 90. This is the nearest thing that the Soviets have produced in the nature of a definitive work on the Second World War. It is a six volume cooperative effort published between 1960 and 1965. Referred to hereafter as *1st. Velik. Otech. Voyn. 1941-45.*

capital was to be raised by consumer goods starvation, and in the case of the peasant literal starvation as grain was sold to pay for imports needed in the industrialization program; the population was made amenable to the process by propaganda and, if necessary, police controls; the whole program, of course, was to be centrally planned.

The targets set for the First Five-Year Plan were incredible. Industrial output as a whole was to be increased by 250 percent and heavy industry by 330 percent. Electric power was to be increased by 400 percent, while even agricultural output was scheduled for a 150 percent rise. Stalin's First Five-Year Plan bears a close resemblance to Mao Tse-tung's "Great Leap Forward" at the end of the 1950s. And to make things even more ridiculous, the XVIth Party Congress in 1930 called for the completion of the Plan in four years instead of five.

The Plan was declared fulfilled at the end of 1932. The Utopian goals had not been attained, but a sizeable industrial expansion had occurred. As one Soviet account describes it: 1,500 large industrial enterprises had come into being, including the Magnitogorsk-Kuznetsk combination for utilizing Ural iron ore and Kuznets coal, tractor plants in Stalingrad and Khar'kov, automobile plants in Moscow and Nizhny Novgorod, a great hydroelectric installation on the Dnieper River, and a plethora of chemical, non-ferrous metallurgical, and aviation plants.³ In spite of setbacks, human suffering

³*Ibid.*, p. 57.

on an incredible scale, and snafus in general, the Stalin scheme for an industrial-military build-up had been launched.

5. EXPANSION OF THE AIRCRAFT INDUSTRY

The major expansion of the Soviet aircraft industry called for in the First Five-Year Plan began from an extremely small base. During the rehabilitation of the national economy in the NEP period (1921-28), the aircraft industry could progress only at a snail's pace because of the lack of a machine-tool industry, the shortage of metals of any quality, and the scarcity of technically trained manpower. During that period the USSR was importing most of its aircraft and just about all of its engines. The 1929-32 period, however, witnessed a real expansion of the aircraft industry; old plants were expanded and modernized and new ones were built. According to an official Soviet source, between 1928 and 1932, the labor force in the aviation industry increased by 750 percent and the number of engineers and technicians by 1,000 percent.⁴

Just how many aircraft plants there were in 1928 and how many were built by 1932 is a matter of confused guessing by Western observers. The guesstimates of the number of aircraft plants in 1932 vary from 6 airframe and 12 engine plants to a total of over 40 (with 150,000 personnel). In the Second Five-Year Plan (1933-37), the output of aircraft quadrupled, going from 860 in 1930 to 3,578 in 1937.⁵ By

⁴*Aviatstroitel'*, No. 6 (June 1933), pp. 1-2 as cited in *The Soviet Aircraft Industry*, Chapel Hill, No. Carolina, Institute for Research in Social Science, 1955, p. 6.

⁵*Ist. Velik. Otech. Voyn. 1941-45*, Vol. I, p. 65.

1938 there were probably around 70 plants (28 airframe, 14 engine, and 32 for other components).⁶ For the year 1939, the authors of *The Soviet Aircraft Industry* were able to verify only 18 plants, but were convinced that there were many more.⁷ As they point out, the Soviet habit of referring to aircraft plants by numbers, or by an honorary designation, e.g. *imeni* [in the name of] Gorbunov, etc. makes for a good deal of confusion. Aircraft plants were built in a number of cities such as Kuibyshev, Gorki, Saratov, Kazan', Novosibirsk, Irkutsk, and even Kharbarovsk in the Far East. An engine plant was built in Perm to produce Wright Cyclone engines under license.⁸

The old "Duks" plant, established by the French in 1912, was the largest and best inherited by the Bolsheviks. It was renamed Plant No. 1 in an effort to expunge its bourgeois background. Since Polikarpov, Mikoyan and Gurevich were designers in this plant it can be reasonably assumed that it was the large-scale producer of fighter aircraft in the pre-WW II period. The Fili plant built by Junkers during the early part of the Red Army-*Reichswehr* honeymoon was redesignated Plant No. 22 *imeni* Gorbunov in the 1930s. Tupolev's

⁶*Fortune*, August 1937, pp. 70-77.

⁷*Op. cit.*, p. 8.

⁸Richard Stockwell, *Soviet Air Power*, New York, Pageant Press, 1956, p. 10.

ANT-3 all-metal plane was produced there. By 1936 it is estimated that its labor force came to 5,000.⁹

Aircraft engines were the real Achilles' Heel of the Soviet airplane industry in the early 1930s, or even up to the middle 1950s. The oldest and largest in the 1930s was the "Gnome-Rhone" French-built plant in Moscow dating to pre-World War days. In the 1930s it was greatly expanded and designated Plant No. 24 *imeni* Frunze. Both A. D. Shvetsov and A. A. Mikulin, two outstanding Soviet engine designers, worked in Plant No. 24 during the late 1920s and early 1930s.

The Soviet scientific-research institutes were intimately connected with the aircraft industry as a whole. TsAGI, headed by Zhukovskiy until 1928 and then by his learned colleague, Sergey A. Chaplygin, an outstanding scientist but apparently a poor administrator as he was soon replaced, was the focal point of research and development in the early years of Soviet aviation. The chief designer at TsAGI was A. N. Tupolev. Other institutes were established in the 1930s such as TsIAM, for research and development of aircraft engines, and VIAM, for testing aircraft construction materials. The scientists and technicians in these institutes worked closely with the aircraft plants.

Although the specifics are lacking, the evidence as a whole seems to indicate a rapid expansion of the Soviet aircraft industry during

⁹*The Soviet Aircraft Industry*, pp. 13-14.

the First and Second Five-Year Plans. By 1940 the industry was turning out around 7,000 planes a year.

6. NEW AIRCRAFT DURING THE 1930s

The First Five-Year Plan called upon the Soviet designers to work ardently at overcoming the country's dependence upon imported foreign aircraft. Polikarpov, the outstanding designer of fighter aircraft in the 1930s, got the jump on the decade by designing his R-5 reconnaissance plane in 1929. It was a single-engine sesquiplane with a BMW-VI engine in its original version. Later (1930) it got the M-17B and still later (1934) the M-17F, thus going from 500 hp to 680 hp during its development. It had a top speed of 135 mph and carried one synchronized and one flexible-mounted machine gun.¹⁰ The R-5 was produced in several versions: a civil transport, the P-5 (*passazhirskiy*, passenger), a dive-bomber, and a two-seater fighter, the DI-2. The R-5 was produced in large numbers and was in use up to 1944 in World War II.

At TsAGI, Tupolev's design bureau was busy on a new bomber, the ANT-6 or TB-3 (*tyazhelyy bombardirovshchik*, heavy bomber), a four-engine cantilever monoplane. Its four engines together developed 2,000 hp and its top speed was 110 mph. The TB-3 was test flown on

¹⁰*Aviatsiya i Kosmonavtika*, No. 10 (October 1973), p. 23. The Soviet designations for engines are as confused as those for aircraft. The BMW was a German engine (*Bayerische Motoren Werke*). The "M" stands for the Russian "motor," the same as in English; "AM" for Aleksandr Mikulin, "Sh" or "ASH" for Arkadiy Shvetsov, and "VK" for Vladimir Klimov. In the early period only the "M" was used and it applied to foreign as well as indigenously produced engines.

22 December 1930 and it went into serial production in 1932. A total of over 800 was turned out and it was used as a night bomber in the early part of World War II.¹¹

At the same time (1930) Polikarpov was designing his I-5 fighter, a single-engine biplane. The plane had an M-15 engine which generated 420 hp and its top speed was 170 mph at 10,000 ft. It went into series production in 1932.¹²

But it was in 1933 that Polikarpov really came to the fore as the preeminent Soviet designer of fighter aircraft when he came up with his I-15 and I-16 in the same year. Although he was working with Sikorsky as early as World War I, his first fighter design was the I-400 in 1923. Over the next two decades, until his death in 1944, he designed some forty planes.

The I-15, designed in 1933, was a single-place seaquiplane with a gull upper wing and powered by a 700 hp M-25 engine (Wright Cyclone built under license). The plane had a top speed of 230 mph at 10,000 ft. and a ceiling of 32,000 ft., although in 1935 a stripped model of the I-15 got to 47,820 ft., an unofficial world record for that period.¹³ Flight-tested in October 1933, the I-15 went into quantity production in early 1934 and entered service in the latter part of the year.

¹¹*Ibid.*, No. 11 (November 1973), p. 22 and No. 12 (December 1973), p. 24.

¹²*Ibid.*, No. 11 (November 1973), p. 23.

¹³Nowarra and Duval, *op. cit.*, p. 97; *Aviatsiya i Kosmonavtika*, No. 1 (January 1974), p. 23.

The I-15 was modified several times over the next few years. In 1934 its fuel capacity was augmented and fitting for auxilliary tanks installed under the wings along with couplings for four 55-lb. bombs. The gull wing of the original version was abandoned. Its original guns were replaced by four ShKAS machine guns.¹⁴ The new version was called the I-15bis or I-152 and went into production in 1936.

In 1938, A. Zh. Shcherbakov of the Polikarpov team modified the I-152. The new model, designated the I-153, had the gull wing of the original I-15, a retractable landing gear, and a 1,000 hp M-62R engine (the old M-25 Wright Cyclone developed by Shvetsov). The I-153 had a top speed of over 250 mph at 10,000 ft. The first of the I-153s went into action against the Japanese in the Khalkhin-Gol embroglio in July 1939 and was still in use in the early period of World War II.¹⁵

Simultaneously with the development of the I-15 in 1933, Polikarpov designed the I-16, a single-seat, single-engine, monoplane powered by a 480 hp M-22 engine (a Bristol Jupiter under license) which gave it a top speed of 220 mph. It was flight-tested on 31 December 1933 and went into production in early 1934. The production version got

¹⁴ShKAS is an acronym for B. G. Shpital'nyy and I. A. Komaritsky, inventors of the new machine-gun. The ShKAS was a 7.62mm gun with a firing rate of 1,800 rounds a minute, and a muzzle velocity of 2,700 ft. per second. As the editors of *Aviatsiya i Kosmonavtika* point out, the ShKAS "began a new stage in the machine-gun armament of Soviet aviation." (No. 3 [March 1974], p. 22)

¹⁵Ncwarra and Duval, *op. cit.*, p. 98.

a new engine, the 775 hp M-25B (Wright Cyclone 9) which increased its maximum speed to 280 mph. The original armament of the I-16, four ShKAS machine guns and RS rockets on wing pylons was modified several times. One model had four ShVAK 22mm cannons,¹⁶ another mounted Beresin 12.7 guns, the equivalent of the US.50 cal., etc.

With the various modifications for improvement, the I-16 remained in production up to 1941 and saw action in Khalkhin-Gol, in the war with Finland, and played a role in the early part of World War II. It was the best of the Soviet fighters in the late 1930s.¹⁷

In 1934 Georgi M. Beriev, chief designer of naval aircraft in the TsKB (Central Design Bureau) since 1932, came up with the MBR-2 (*morskoy blizhny razvedchik*, naval short-range reconnaissance). It was a monoplane flying boat with a single 700 hp engine, the M-17B, and had a top speed of 125 mph. Over 1,300 MBRs were produced. Its outstanding seaworthy character led to its adoption as a civil transport, the MP-1. Beriev, two years later, designed another winner, the Be-2, a shipboard reconnaissance biplane with a single 700 hp engine. It was assisted on take-off by a catapult. Its top speed was 175 miles per hour and it was armed with two ShKAS guns on flexible mounts. It went into serial production immediately after passing the state tests.¹⁸

¹⁶ShVAK is an acronym for "Shpital'nyy, Vladimir, aviatsionnaya krupnokalibernaya, aviation large caliber." This new 20mm cannon had a rate of fire of 820 rounds a minute, a muzzle velocity of 2675 ft. a second, and it could pierce a 0.75-inch steel plate at 2,000 ft.

¹⁷*Aviatsiya i Kosmonavtika*, No. 1 (January 1974), p. 23.

¹⁸*Loc. cit.*, No. 2 (February 1974), p. 23 and No. 7 (July 1974), p. 22.

Beriev's competitor in the flying-boat field, Igor V. Chetverikov, produced only one winner, the MDR-6 (*morskoy dal'niy razvedchik*, naval long-range reconnaissance) redesignated the Che-2 in 1941. It was a twin-engine (two M-63s of 1,100 hp each), gull-wing monoplane with a top speed of 220 mph at 13,000 ft. Flight tested in mid-1937, it went into production in 1938. Over the next eight years, Chetverikov produced several versions of the MDR-6, the last one in 1946.¹⁹

One of the most popular planes designed in the late 1930s was Aleksandr S. Yakovlev's UT-2 (*uchebno-trenirovochnyy*, basic trainer). Designed in 1935, it went into quantity production in 1938, and over 7,000 were eventually manufactured. It was a two-seater monoplane with a 100 hp M-11 engine which gave it a top speed of 130 mph. Its excellent handling characteristics made it the best Soviet trainer of the late 1930s.²⁰

In the meanwhile Tupolev was continuing to turn out new bombers. In 1934, assisted by A. A. Arkhangel'skiy, he produced the SB-2 (*skorostnoy bombardirovshchik*, fast bomber) or ANT-40. It was a monoplane powered by two 860 hp M-100 engines (Hispano-Suiza 12-cylinder built under license) and had a top speed of 230 mph. The SB-2 carried four ShKAS guns and a ton of bombs. Successfully tested in mid-1935, it went into production immediately, the output

¹⁹Jean Alexander, *Russian Aircraft Since 1940*, London, Putnam, 1975, pp. 80-84.

²⁰*Aviatsiya i Kosmonavtika*, No. 4 (April 1974), p. 23.

reaching 6,666 planes before being shut off. Its M-100 engines were replaced by M-100As, which boosted its speed to 300 mph, variable-pitch props helped, and its fuel load was increased. In November 1936 the SB-2 set a world record when it climbed to 12,695 meters (41,640 ft.) with a one-ton load. It first saw action in the Spanish Civil War, was used in China, and even in World War II.²¹

A year later, in 1936, Vladimir M. Petlyakov's team,²² under Tupolev's management, designed the ANT-42 or TB-7 bomber (*tyazhelyy bombardirovshchik*, heavy bomber). It was first flown in December 1936, but did not go into serial production until 1939 and into service until 1941. Production of the Pe-8, as it was called by then, was phased out in 1944. It was a four-engine monoplane bomber powered, in its earliest production version, by four Mikulin-designed AM-35A (1,350 hp each) engines. It had a top speed of 250 mph, a range of 3000 miles, increased in 1941 to 4,800 miles when it got M-30B engines, and it carried a bomb load of 4,400 lbs.²³

Pavel O. Sukhoy, who was to become an outstanding aircraft designer in the postwar period, produced only one plane of note in the 1930s,

²¹Nowarra and Duval, *op. cit.*, pp. 107-110; *Aviatsiya i Kosmonavtika*, No. 2 (February 1974), pp. 22-23.

²²Petlyakov worked with Tupolev from 1920 on, and in 1936 was made chief of the experimental design section of TsAGI. The TB-7 really his baby and its later designation of Pe-8 a recognition of the fact. See Alexander, *op. cit.*, p. 295 for more details.

²³*Aviatsiya i Kosmonavtika*, No. 5 (May 1974), pp. 22-23.

the Su-2 or BB-1 (*blizhny bombardirovshchik*, short-range bomber) in 1939. He was on the Tupolev team at TsAGI in the 1920s and 1930s, but left in 1936 to take charge of an aircraft plant at Komsomol'sk-na-Amur where he began work on what was later to become the Su-2. It was completed in 1939 and went into mass production in 1940. It was first called the BB-1, but soon redesignated the Su-2. The plane was a two-seat, single-engine low-wing monoplane of mixed wood and metal construction. The M-88 engine (1,000 hp developed by Tumansky) gave it a top speed of nearly 300 mph. Its armament consisted of four 7.62mm ShKAS guns, 1,320 lbs. of bombs, and six RS-82 missiles under the wings. A total of 500 was produced. It was used as a dive-bomber in the opening stages of World War II.²⁴

Boris P. Lisunov, a minor designer, is credited with the development of the Li-2 transport in 1939. Lisunov was sent to the Douglas plant in the United States to look over the DC-2 as a possible Soviet purchase, but while there he recognized the extraordinary virtues of the DC-3. As a result, the Soviets got a license to build it. Thus the Li-2 was a Russian version of the famous Douglas DC-2 (C-47) Gooney Bird of immortal fame. It was powered by two ASh-62 engines (Wright Cyclones) and armed with a ShKAS gun in the dorsal hatch. Its top speed was 180 mph and its range, depending upon load, gas capacity, etc., varied from 700 to 1,600 miles.²⁵

²⁴Alexander, *op. cit.*, pp. 321-26.

²⁵Nowarra and Duval, *op. cit.*, pp. 134-35.

The I-15 series, the I-16, the SB-2, and the TB-3, plus the R-5 reconnaissance plane, were the best machines available to the Soviet Air Force in its subsequent adventures in Spain, China, and Mongolia in the late 1930's. By 1937, the end of the Second Five-Year Plan, the Soviet Military-Air Forces, VVS (for the Russian *Voennovozdushnye-sily*), had a front-line strength of around 2,500 aircraft, organized in 40 to 50 brigades. In November 1936, V. V. Khripin, Deputy Chief of the VVS, claimed that his air force was the strongest in the world and that its combat strength had been quadrupled since 1932. He also stated that 60 percent of the combat aircraft in the VVS were bombers, which brings up the subject of the role and mission of the bomber in the VVS as visualized by the Soviet strategists of that era.

There had for some time been Soviet military theorists favoring independent bomber operations, probably influenced by General Giulio Douhet's theories, popular in the late 1920's and the 1930's among a number of military theorists throughout the world. Douhet saw the strategic bomber as the pre-eminent weapon in future wars. A. N. Lapchinsky, an early Soviet theorist on airpower, had pointed out the importance of strategic bombing in the mid-1920's, although he did not go all the way with Douhet's thesis that it was the be-all and end-all in determining the outcome of war. Lapchinsky also saw aviation as an integral part of the combined arms of the country, with a very heavy commitment to close support for the ground forces. Khripin, in the mid-1930's, held similar views, especially since the

two most likely potential enemies of the Soviet Union, Germany and Japan, presented such tempting industrial targets. In an era of relatively poor anti-aircraft weapons and before the advent of radar, even the rather primitive bombers of the VVS appeared to have potentialities as a means of getting at the enemy's industrial heartland.²⁶ For example, the Soviet strategic bomber force in the Far East, although small, did have the capability of reaching some Japanese cities, and in the West, German targets were within range. The adventure in Spain (1936-38), however, was to disillusion these early enthusiasts for strategic bombing with its city-busting potential.

During the period of the first two Five-Year Plans, the military leaders found another use for their proliferating aircraft, namely to carry paratroopers and their support equipment behind the enemy lines to disrupt the opponent at some depth. The parachute troops, an idea which Tukhachevsky pushed vigorously, were first organized in 1931 in two small units. The available aircraft, such as the TB-1 and R-5, were not adequate for anything beyond small operations, but the introduction of the TB-3, the four-engine bomber and its transport version, changed the picture by 1934 so that the build-up of the airborne forces could proceed apace. By 1935 the military leaders had enough confidence in their airborne troops to inject them into the main maneuvers at Kiev and before foreign military observers

²⁶John Erickson, *The Soviet High Command*, New York, St. Martin's Press, 1962, pp. 382-83.

at that. The TB-3s dropped some 600 paratroopers to secure a defense perimeter; then successive waves of planes brought in infantry and support equipment to consolidate the area seized. In 1936 the paratroopers again proved their effectiveness in the maneuvers held in Byelorussia and in the Caucasus.

Although the parachute troops had their troubles during the purges between 1937 and 1939, especially the execution of their mentor, Tukhachevsky, their strength was steadily increased. By 1938 the airborne troops were organized into four brigades, about 1,000 men each with three brigades being stationed in the military districts facing the Baltic countries and Poland and the fourth being sent to the Far East.²⁷

One of the real problems involved in the creation of a bigger and more potent VVS in the 1930s was that of training the pilots and the technicians needed to keep the aircraft operational. Although a Soviet calculation in 1933 that it would take over a hundred trained men to keep one airplane serviced and operational was certainly an exaggeration, nevertheless, the demand for trained manpower was bound to increase exponentially as the aircraft poured off the assembly lines and were sent into operational units. There were, however, a couple of developments assisting in the solution of the problem. For one thing, the on-going mechanization of agriculture as a result of collectivization was providing a reserve of potential mechanical

²⁷Asher Lee, *The Soviet Air Force*, New York, John Day Co., 1962, pp. 95-99.

literates as the peasants tinkered with and operated the tractors and trucks. In addition, the Society for the Promotion of Defense, Aviation and Chemical Warfare, called *Osoaviakhim* in its Russian acronym, a voluntary organization dedicated to training young people in those skills needed by the armed forces, taught tens of thousands how to operate, maintain, and repair engines, radios, and motor vehicles. *Osoaviakhim* also saw to it that the young enthusiasts learned how to shoot straight and even had its own aircraft in which future pilots could learn the rudiments of flying. But in spite of all this outside help, the VVS had to become one great technical training institution with academies and flying schools mushrooming up all over the country.²⁸

In the mid-1930s, the Soviets went in for gaining world publicity in aeronautical exploits, a sign of their growing confidence in fliers and machines. The first publicity break came in February 1934, when the ice-breaker, "Chelyuskin," with a party of scientists aboard, was caught in the ice and sunk. The government pulled out all the stops in launching an air-rescue mission, and using an ANT-4 and some R-5s, the Soviet airmen managed to get everyone off the ice-floe upon which they were stranded. On 20 April, the government created a new medal, Hero of the Soviet Union, to bestow on the seven outstanding pilots involved in the mission, and the other 19 fliers and support

²⁸See Kenneth R. Whiting, "Soviet Civil and Paramilitary Air Power," in Eugene M. Emme (editor), *The Impact of Air Power*, New York, Van Nostrand, 1959, pp. 582-583.

personnel got Orders of Lenin.²⁹ In September 1934, M. M. Gromov, pilot, and I. T. Spirin, navigator, flew an ANT-25 on a closed-circuit route of 12,411 kilometers in 75 hours. The ANT-25, a Tupolev creation as the designation "ANT" indicates, was a low-wing monoplane with a retractable landing gear and equipped with a 950 h.p., m-34 Vee liquid-cooled 12 cylinder engine. It had a maximum speed of 150 mph and a flight duration of 65 hours. This aircraft gave the Soviets a chance to indulge in some spectacular long-distance flying in the next couple of years.

In 1936 and 1937 the Soviets sought all kinds of records. V. K. Kokkinaki, A. B. Yumashev, and M. A. Nyukhtikov garnered some ten altitude records in 1936. In July 1936, V. P. Chkalov and G. F. Baydukov, both test pilots, along with their navigator, A. V. Belyakov, flew an ANT-25 from Moscow along the Arctic coast and over Kamchatka to Udd Island (now Chkalov Island) in the mouth of the Amur River, a distance of 9,374 kilometers in 56 hours, 20 minutes. In June 1937, the same trio flew their ANT-25 from Moscow to Vancouver via the polar route, a 9,130-kilometer flight that took 63 hours, 16 minutes. A month later, the pilots Gromov and Yumashev, with navigator S. A. Danilin, also in an ANT-25, made the trans-polar flight from Moscow to San Jacinto, California, covering 11,500 kilometers in 62 hours, 17 minutes.

There were other feats in 1937, and, in 1938, three women, V. S. Grizodubova, P. D. Osipenko, and M. M. Raskova, flew their ANT-27,

²⁹ *USSR In Construction*, No. 10 (October 1934); the whole issue devoted to the "Chelyuskin" rescue operation and following festivities.

named "Rodina" (The Motherland), 5,908 kilometers in 26 hours, 29 minutes to establish a world record for women. The achievements in long-distance flying and in breaking world records in altitude and speed did much to bolster Soviet confidences in both flying personnel and Soviet aircraft, losing nothing in the telling in the Soviet media--the whole business resembled the later arduous Soviet approach to the Olympic games.

7. THE VVS IN ACTION IN THE 1930s

While Stalin was busy pushing industrialization and building up a formidable military force in the late 1920s and early 1930s, he was trying to follow a relatively non-belligerent foreign policy. The disaster that befell the Soviet intervention in Chinese affairs in 1924 to 1927, the diminution to the zero point of any chance of revolution in Western Europe in the early 1930s, plus the concentration upon the "building of socialism in one country"--all contributed to a semi-isolationist period in Soviet foreign policy. There was, however, some apprehension about Japanese objectives in the Far East, apprehensions that led to the formation of the semi-autonomous Special Far Eastern Army in August 1929, including an air force.

But the only Soviet military action in the Far East in this period was a conflict with the Chinese over the Soviet rights to co-management of the Chinese Eastern Railway, which crossed Manchuria between Manchouli and Vladivostok. The situation in Manchuria was unbelievably complicated in the late 1920s. The Japanese had tried to use the warlord of Manchuria, Chang Tso-lin, to further their aspirations in

that area, but when Chiang Kai-shek defeated him in 1928 and he was forced to flee to his base of operations in Manchuria, the Japanese assassinated him by blowing up his train near Mukden. They hoped his son, Chang Hsueh-liang, "The Young Marshal," would be more malleable, but soon discovered their mistake when he threw in his lot with the new Kuomintang government in Peking.

Chang Hsueh-liang, like his father, was intensely anti-Communist and began a campaign to drive the Russians out of the Chinese Eastern Railway administration, a campaign that increased in virulence in 1929. Blyukher, the commander of the new Special Far Eastern Army, had built his force to about 100,000 men, supported by tanks and aircraft. Moscow instructed him to prepare for action against the Young Marshal, a campaign that was to be swift and effective in order to keep the Japanese from getting too worried about the Russians plunging about in a bailiwick the Japanese hoped to acquire for themselves. The Japanese Kwantung Army, named after its location in the Kwantung Peninsula in Manchuria, which had been "leased" from the Chinese, was keeping a wary eye on the Russians. In October Blyukher's forces hit the Chinese along the Sungari River and also encircled a large force near Manchouli, and in about six weeks Chang Hsueh-liang's troops were beaten. The Soviets used 32 aircraft in the operation, the first real blooding of the VVS.³⁰ Although there were some snafus and mistakes, the Soviet forces looked so effective in the

³⁰A good brief account in Erickson, *Soviet High Command*, pp. 241-44.

operation that the Kwantung Army leaders began to speed up their plans for a complete take-over of Manchuria before the Russians got any stronger in the Far East. The Japanese took over Manchuria in September 1931, a move that put their soldiers right on the Soviet borders in the Far East as well as on the Mongolian border.

The Soviets, extremely worried about the Japanese belligerency in northern China and along the Soviet borders, increased feverishly their military strength in that area. Tanks, fighter aircraft, and bombers were added to Blyukher's Special Far Eastern Army, and the Trans-Siberian Railway's efficiency was augmented by intensive efforts in double-tracking. By late 1934 Blyukher's army consisted of 14 rifle and 3 cavalry divisions, 950 aircraft, and 900 tanks. The Japanese General Staff estimated that in addition the Soviets had about 150 bombers in the Maritime Provinces capable of hitting the Japanese homeland. These facts tended to quieten the hot-heads in the Kwantung Army for the time being.³¹

By 1934 it was obvious that Stalin was going to have to shelve his "semi-isolationist" policy and seek foreign allies, for in addition to the Japanese expansionism in the Far East, Hitler was becoming a threat in the West. In January 1934 the latter signed a ten-year non-aggression pact with Poland and began to mutter about German designs on the Ukraine--a subject more than adequately covered in his *Mein Kampf*. Something had to give since the Soviets faced

³¹*Japanese Special Studies on Manchuria*, Office of the Chief of Military History, Department of the Army, 1956, Vol. XIII, p. 46.

potential enemies in both the East and the West, the perennial nightmare of Russia's policy-makers, Tsarist or Communist. In September 1934 the Soviet Union joined the League of Nations, began to angle for alliances with France and Czechoslovakia, both signed in 1935, and at the Seventh, and last, Comintern Congress in July-August 1935 adopted a "united front" policy which called on all Communist parties to cooperate with any anti-fascist party, whatever its leanings otherwise. Stalin had opted for a collective security system, anchored on Great Britain and France, to offset the German and Japanese threats.

Hardly had Stalin moved toward collective security, when his partners began to look less than reassuring. When Mussolini invaded Ethiopia in October 1935, the League did little beyond some mild vocalizing. On 7 March 1936 Hitler remilitarized the Rhineland, while France and Great Britain, with specific authority to act, did nothing. Then came the Civil War in Spain. Franco revolted against the Republican Government on 19 July 1936, thus threatening to put France in the middle of three fascist states if he won. But France and Britain went for cover under a "non-intervention" facade, and Germany and Italy cynically gave lip-service to this policy while all the while helping Franco. Stalin was in a dilemma. Failure to support the Republicans would alienate the popular fronts in many countries, especially in France, but too open an intervention would frighten the French and British governments. If he intervened in Spain, it would have to be a cautious intervention.³²

³²Walter Krivitsky, Stalin's top Military Intelligence agent in Western Europe during the Spanish Civil War, claims that Stalin was

Stalin found a way out of the dilemma by avoiding a large commitment of Soviet troops in Spain. Communist agents recruited an International Brigade from all over Europe and the Western Hemisphere, some being Communists and others merely sympathizers with the Republican cause. Although the International Brigade probably totalled some 60,000 men during the entire war, there were never more than 30,000 in Spain at any one time. The only direct Soviet involvement was in supplying aircraft, tanks, and artillery with support equipment. Red Army specialists did fly the aircraft, operate the tanks, and act as instructors to the Republican troops in those weapons. The first Soviet aid began in October 1936 when a Norwegian freighter delivered some Soviet aircraft, tanks, and artillery to Spain.

Just how many men Stalin sent to Spain is an insoluble problem. According to an official Soviet account, he sent "557 Soviet volunteers including 23 military advisors, 49 instructors, 29 artillery experts, including anti-aircraft specialists, 141 aircraft pilots, 107 tank drivers, and 29 sailors; communications specialists, engineers, and doctors totalled 106, and there were 73 interpreters and other specialists."³³ Other sources, equally unreliable, give much higher figures.

In aircraft, the Soviet assistance was approximately 1,500 machines, although in any one month not more than a third of that number was operational. Of the thousand or so fighter aircraft, around 500 to

doubly cautious because he did not want to make it impossible to come to terms with Hitler eventually. See Krivitsky's book, *In Stalin's Secret Service*. New York, Harper and Brothers, 1939. *Passim*.

³³*Ist. Velik. Otech. Voyn. 1941-1945*, Vol. I, p. 113.

600 were I-15s or I-15 *bis*'s and the rest were I-16s.³⁴ There were over 200 SB-2 bombers, the rest R-5 reconnaissance planes. Soviet aircraft made up over 90 percent of the Republican air force by early 1937 so that the Republicans had air superiority until late that year. At that point the Nazis equipped the Condor Legion in Spain with Me-109 fighters and Ju-87 dive-bombers which were superior to the Soviet I-15s and I-16s. The obvious inability of the Soviet fighters to oppose the Germans successfully led Stalin to begin phasing out the Soviet air force in Spain in mid-1938 so that by the end of the year all Soviet aircraft were out of the country.

Although Soviet fliers gained valuable combat experience in Spain, the concepts derived were mostly negative. For example, the VVS came to the conclusion that strategic bombing was an ineffective use of fliers and machines, a conclusion the German's also drew from their Spanish experience. In retrospect, considering the modesty of the bombing effort in both cases, plus the rather primitive equipment involved in that effort, it is not surprising that neither the *Luftwaffe* nor the VVS was impressed with the results obtained in the Spanish adventure. The Soviet pilots were also made painfully aware of the inferiority of their machines in combat with the German Me-109s. All in all, the Soviet involvement in the Spanish Civil War, especially

³⁴The I-16 had many nicknames applied to it during the Spanish Civil War. It was called *Rata* (Rat) by the Franco forces, *Mosca* (Fly) by the Loyalists, while the Soviet fliers referred to it as *Ishak* (Donkey). With its short, barrel-like configuration it was an easy plane to identify and everyone in Spain got to know it.

in the air war, was far from successful,

The Soviets, while trying to consolidate a "united front" against Germany and Italy in Europe and aiding the Spanish Loyalists in their own peculiar way, were not neglecting the Far East region threatened by the Japanese expansion into Manchuria, Northern China, and Inner Mongolia. Every effort was put forth to make the Special Far Eastern Army as self-sufficient as possible so as to be able to face Germany and Japan simultaneously if worst came to worst. The Japanese estimated that Blyukher's army east of Lake Baykal had quadrupled its strength between 1931 and 1936 and in the latter year consisted of nearly 20 rifle and 4 cavalry divisions plus 1,200 aircraft and an equal number of tanks. When the Japanese began their all-out attempt to conquer the rest of China in July 1937, the Soviets added still more men and equipment to their Far Eastern Forces and the number of aircraft rose to nearly 2,000 by 1938.³⁵

Relieved that the Japanese thrust was against China and not against the USSR, Stalin saw much to be gained in helping the Chinese in their struggle, thereby keeping the Japanese busy enough in China to discourage any serious incursions into Soviet territory. The main Soviet contribution in the Sino-Japanese War was aircraft and pilots.

The Chinese Air Force (CAF) had fewer than a hundred first-line planes in July 1937; four months later the Japanese had just about eliminated those. Thus when Soviet aircraft began arriving in October

³⁵*Japanese Special Studies on Manchuria*, Vol. XIII, p. 53.

1937, the CAF was at its nadir and nowhere to go but upward. At first the Soviets tried flying the aircraft from the Turk-Sib Railroad in Kazakhstan across Sinkiang to Lanchow in Kansu Province, where the aircraft were prepared for combat and then dispersed to other air bases. But the air route was so hazardous and so lacking in navigational aids and air-fields that the Soviets discontinued ferrying and began to ship the dismantled planes by truck over a road built by tens of thousands of Chinese in late 1937 and early 1938. By mid-1938 the trucks were able to travel from the Soviet frontier as far as Chengtu and Chungking in Szechwan Province, a distance of over 3,000 miles. Travelers in China in 1938 reported seeing thousands of Soviet trucks hauling aircraft, weapons, and ammunition.

The Soviets not only delivered aircraft to the beleaguered Chinese but also set up and maintained depots and assembly plants, trained Chinese pilots, and sent in "volunteer" Russian pilots to engage the Japanese in combat. For example, on 29 April 1939, in an air battle against a Japanese bombing attack on Wuhan, over half the 65 Soviet-built fighters in that engagement were flown by Russians. The Japanese lost most of their bombers and a high percentage of the accompanying fighters, leading the Japanese Ambassador in Moscow, Shigemitsu, to protest the Soviet involvement, claiming that the Soviet Union had sent to China (up to May 1938) some 500 planes and 200 pilots.

The Soviet aircraft sent to China were I-15 and I-16 fighters, SB bombers, and a few TB-3 heavy bombers, the last used mostly as

transports. The I-15s and I-16s, which had shown up badly against the Me-109s in Spain, did much better against the less effective Japanese fighters of that period, and the Soviet pilots in China were able to evaluate the ability of the Japanese pilots, to study their air tactics, and to observe Japanese equipment. In 1938 China was the ideal area for testing Soviet aircraft and trying out air tactics under actual combat conditions. It was in China that the Soviet pilots realized that the 7.62mm machine gun was a very inadequate weapon for making bomber kills and as a result began the installation of the 12.7mm gun, the equivalent of the American 50-caliber. The control of the air, easily acquired by the Japanese following the near annihilation of the CAF in 1937, was getting more difficult to maintain in 1938 as Soviet aircraft and pilots entered the fray.

Soviet activity in China slowed down somewhat in early 1939, although the air war was intense in the Lanchow-Sian area in February and March when the Japanese made a serious attempt at interdicting deliveries coming over the highway from Sinkiang. During May-through-September period, the Soviets were busily engaged in an open confrontation with the Japanese along the Mongolian border and thus had less to spare for the CAF. But after September, the deliveries were increased. At this time the Soviets moved units into Chengtu and Chungking and took over the air defense of those cities. In September 1939 the American Ambassador in Moscow claimed that the Russians had sent at least 1,000 aircraft and 2,000 pilots to China. Since Moscow limited its pilots to not more than six months in China, the latter

figure does not seem out of line with the facts.

The Winter War with Finland in late 1939 and early 1940 slowed down Soviet deliveries to China, but they picked up again in mid-1940. Although the Chinese were anxious to get newer and better fighters from the Soviets, especially since the new Japanese planes were making things more and more difficult for the old I-15s and I-16s, the Russians ignored their plea. By late 1940 the Russian pilots had been withdrawn from China, partly because the CAF had by then enough trained pilots to man the available aircraft and partly because Stalin was now anxious to pacify the Japanese in order to concentrate on the Western front, a policy that culminated in the Soviet-Japanese neutrality pact in April 1941.

There can be no doubt that between late 1937 and the end of 1940, for well over three years, the CAF was mainly dependent upon Soviet assistance. A US State Department report in 1941 estimated that the Soviets had supplied China with more than 700 aircraft and about 40,000 tons of weapons and ammunition. On the other hand, Stalin's policy had helped keep the Japanese military bogged down in mainland China, had enabled a large number of Soviet pilots to gain combat experience, and had provided a laboratory in which to test Soviet aircraft and equipment under combat conditions.³⁶

³⁶The best account of the Soviet involvement in the Sino-Japanese War is Gordon Pickler's unpublished doctoral dissertation, *United States and the Chinese Nationalist Air Force, 1931-49*, Florida State University.

While the Soviets were engaging the Japanese indirectly in China in the late 1930s, they found themselves in direct confrontation on two occasions: at Changkufeng, or Lake Khasan, in 1938, and at Khalkhin-Gol in 1939. On both occasions it would seem that the Japanese were feeling out Soviet resolve and capability, and in both confrontations the Soviets demonstrated an ability to defend their borders. To have succeeded, the Japanese would have had to draw upon forces committed in China, a price they were unwilling to pay for dubious gains against the Soviet Union.

The Lake Khasan engagement, to use the Soviet terminology,³⁷ began in early July 1938 when the Japanese protested the Soviet fortifying of Changfukeng Hill, a point between Lake Khasan and the Tumen River on the Korean-USSR border, an area under dispute. The line defined in the Hunchun Protocol of 1886 was no longer easy to determine as the old wooden boundary posts had long since rotted away, and both the Japanese and the Russians claimed the area, although why either wanted it is hard to understand. When the Japanese attacked on 29 July, the frontier skirmish rapidly escalated into a "limited war" of some proportions. For almost two weeks both sides increased their commitments until the Soviets had a force of 27 infantry battalions plus several regiments of artillery and tanks. The Japanese had either to reinforce or to cease operations; they took the latter option.

³⁷Soviet historians refer to the engagement as the Battle of Lake Khasan. A detailed account is given in *1st. Velik. Otech. Voyn. 1941-1945*. Vol I, pp. 231-37. The Soviets say the Japanese were the aggressors. The Japanese call it the Chengkufeng Incident.

In their opinion the engagement was getting beyond a "limited" one as can be surmised from the fact that the Japanese later admitted to 1,439 casualties. Hostilities ceased on 11 August and the Soviets were left in command of Changfukeng Hill and the surrounding terrain east of the Tumen, the line originally claimed by them.

The VVS component of the 1st Independent Red Banner Far Eastern Army, which confronted the Japanese at Lake Khasan, was commanded by P. Rychagov, who was executed in 1941 as one of the scapegoats for the massive Nazi destruction of Soviet aircraft. His airmen, facing light Japanese opposition, were able to penetrate the enemy positions in depth and demonstrated a considerable capability. But the Soviet aviators also found that aviation was not very effective against an enemy well entrenched with his artillery well dug in.³⁸

The Lake Khasan incident stimulated further increases in the size of the Soviet military forces in the Far East, including the dispatch of the 57th Special Corps to Outer Mongolia to implement the Soviet-Mongolian treaty of mutual assistance signed in March 1936. On 31 May 1938, Molotov, speaking before the Supreme Soviet, stated clearly that "in virtue of our treaty with Mongolia, we shall defend its frontiers as energetically as our own. . . ."

The boundaries between Outer Mongolia and Manchukuo were badly

³⁸ *Japanese Studies on Manchuria*. Vol XI, Part 3, Book A. "Small Wars and Border Problems: The Changkufeng Incident." Office of the Chief of Military History, Dept of the Army, 1956, pp. 120-121. The Japanese claim that the Russians employed 27 infantry battalions, 100 pieces of artillery, 20 tanks, and a sizeable number of aircraft. *Ibid.*, pp. 115 and 117.

defined as befitted semi-desert grazing areas inhabited by nomads following their flocks with little regard to international boundaries. With the Japanese undertaking the guarantee of the boundaries of Inner Mongolia and Manchukuo and the Soviet Union supporting Outer Mongolia's territorial integrity, and with the Soviet Far Eastern Army commanders cocky over their victory at Lake Khasan and the Japanese Kwantung Army leaders thirsting for revenge, it took no prophet to foresee a clash between the two guarantors. This was the atmosphere in which a frontier incident took place on the Manchukuo-Outer Mongolian border in May 1939. The war that ensued is called the Khalkhin-Gol incident by the Russians.³⁹ The actual territory under dispute was ridiculous: a small stretch of utterly useless semi-desert lying between the Khalkin-Gol River and a small village called Nomonhan, about 10 miles east of the river.

On 11 May 1939, a force of Japanese cavalry, supported by 40 aircraft, attacked the Outer Mongolian frontier guards at Nomonhan and forced them to pull back to the Khalkhin-Gol. The Soviets jumped into the fray and sent troops to hold the region east of the river, a situation leading to intense fighting from the 12th to the 22nd

³⁹ The Japanese refer to the conflict as the "Nomonhan Incident," while the Soviets call it the "Khalkhin-Gol Incident." The best account representing the Japanese point of view is in the two-volume work: *Japanese Studies in Manchuria*, Vol. XI, Part 3, Books A and B, "Small Wars and Border Problems: The Nomonhan Incident." Office of the Chief of Military History, Dept of the Army, 1956. This work also includes an English translation of a Soviet account: S. N. Shishkin, *Khalkhin-Gol*, Moscow, Military Publishing House, 1954. The most recent Soviet effort is in *1st. Velik. Otech. Voyn. 1941-1945*. Vol I, pp. 236-245. Also see Erickson, *op. cit.*, pp. 517-23 and 532-37.

of May. Kwantung headquarters responded by dispatching a large contingent of infantry from Hailar in Manchukuo thus escalating a frontier incident into a "limited war." On 28 May the Japanese tried to cut off the Soviet-Mongolian forces east of the river, but Soviet artillery superiority and close air support wrecked their strategy. It was now obvious to Kwantung headquarters that only a major force could dislodge the Soviets, and they accordingly began such a build-up; but it was more than offset by Soviet reinforcements.

The war was characterized during June by an expansion of air activity, with both sides using up to 100 aircraft on occasion. On June 27th, for example, the Japanese used 80 fighter and 30 bombers to attack a Soviet airbase in Outer Mongolia. Tokyo, not nearly as enthusiastic about escalating the Khalkhin-Gol conflict, ordered a cessation of such large-scale air attacks. In spite of Tokyo's desires, however, the Kwantung Army leaders launched a furious attack between the 2nd and 4th of July and another one between the 23rd and the 25th.

The Soviets responded in July by creating a greatly reinforced 1st Army Group in Mongolia with G. K. Zhukov in command. When Zhukov launched his counteroffensive on August 20th, he had a 1.5 to 1 superiority in infantry and cavalry, 2 to 1 in artillery, 4 to 1 in tanks, and 1.6 to 1 in aircraft.⁴⁰ He insisted on a very close ground-air cooperation; this was developed by having the pilots study the

⁴⁰*Ist. Velik. Otech. Voyn. 1941-1945, Vol. I, p. 240.*

terrain with the infantry and armored troops and by the creation of special reconnaissance groups. By the end of August the Japanese had been pushed over the Mongolian version of the border, and an armistice was agreed upon to go into effect on September 16th.

The Khalkhin-Gol "incident" was really a small war, with the Russians using 35 infantry battalions, 20 cavalry squadrons, 500 tanks, and 500 aircraft, the Red Army's first test involving a massive use of artillery, tanks, and aircraft, acquitting itself with distinction. Zhukov, who won his spurs at Khalkhin-Gol, used his aircraft successfully to inhibit enemy reinforcement of the battlefield. The Kwantung Army leaders were impressed by the Soviet performance so that it may have been very influential in the Japanese decision to go south in 1941 instead of moving north against the Soviet Union.

While the Red Army and its VVS were fighting as far afield as Spain, China, and on the Mongolian border during the 1937-39 period, Stalin was ruthlessly butchering its top leaders in almost insane fashion. The Great Purge had hit the civilians as early as 1934, but the military was immune from arrest until 1937. Then, on 23 January 1937, the trial of the "anti-Soviet Trotskyite Center" began; in the course of the trial Radek, one of the main defendants, mentioned Marshal Tukhachevsky's name some ten times. Since this was a "show-trial" for public consumption, Radek's constant reference to Tukhachevsky could not have been an accident and it was obvious that he was in deep trouble. In retrospect it seems obvious that

Stalin had lost confidence in the political reliability of the Red Army command, felt it necessary to strike down the top commanders first, and then get at their underlings later. Tukhachevsky was arrested on 22 May and on 11 June he, along with six other top commanders, was tried by a special military tribunal made up of such high-ranking officers as Alksnis, VVS Chief, Budenny, commander of the Moscow Military District, Blyukher, head of the Far Eastern Army, and Shaposhnikov, Chief of the General Staff. The Defendants, being found guilty of treason and other crimes, were shot the following day.

The execution of Tukhachevsky and his companions was only the first step in a senseless blood purge of the Red Army that all but eliminated the top echelons of the officer corps. During the Purge, the Red Army lost 3 marshals, 11 Deputy Commissars for Defense, 57 corps commanders, 110 divisional commanders, and 186 brigade commanders. Guesses as to the fatalities among the 75,000 or so officers in the Red Army range from 15,000 to 30,000. No army could stand a blood purge of that dimension without suffering pernicious anemia in its command system.⁴¹

Soviet aviation was especially hard hit by the Purge. Ya. I. Alksnis, who had succeeded Baranov as commander of the VVS in 1931, was arrested in 1937, probably dying in 1940. His deputy, V. V. Khripin also disappeared in 1937. Alksnis was succeeded by a

⁴¹Erickson, *op. cit.*, pp. 505-506.

nonentity named A. D. Loktionov, who in turn gave way in September 1939 to Ya. I. Smushkevich. The latter was a veteran of the Soviet air activities in Spain and had made quite a reputation as an air commander in the Far East. Incidentally, he was destined to be shot as a scapegoat during the debacle of June 1941. In addition to Alksnis and Khripin, such outstanding VVS officers as I. A. Lopatin, commander-in-chief of the Leningrad Air Command, and R. A. Muklevich, a senior general in frontal aviation, were also victims of the Purge. About 75 percent of the senior officers in the VVS were eliminated by the end of 1939. The Purge also extended to the aircraft industry, to the research organizations such as TsAGI, TsIAM, and VIAM, and to some of the design bureaus. Even Tupolev was under arrest for a short period. It would seem fair to say that the poor showing of the VVS in the Winter War with Finland and in the early phase of the Great Patriotic War could be at least partially attributed to Stalin's blood lust in the late 1930's.⁴²

While Zhukov was whipping his 1st Army Group into shape to finish off the Japanese, some delicate negotiations were going on in Moscow. Stalin was negotiating with his "collective-security" partners, Britain and France, on one hand while simultaneously conducting secret talks with the Germans on the other hand. The British and French military missions were in Moscow to argue with Voroshilov about how far they would go in supporting the Soviet Union in the

⁴² *Ibid.*, pp. 500-501.

event of war with Germany. The debate seemed to hinge on Poland's willingness to allow Soviet forces inside its national boundaries to carry out a forward strategy against the German attack, and the French and British attitude on Soviet hegemony over the Baltic countries. Stalin felt that the Poles, French and British were dragging their feet during the talks and was also suspicious that the French and British were inclined to push Hitler to the East. The upshot was the surprise announcement of the Soviet-German Non-Aggression Pact on 23 August 1939.

The important part of the pact was a secret protocol which divided Eastern Europe into German and Soviet spheres of influence. Poland was to be divided along the Narew-Vistula-San river line and the Soviet sphere also included Finland, Latvia, and Bessarabia. The Germans were to dominate everything west of the line, and each was to be boss within his own sphere with no questions asked. Having insured himself against a two-front war, Hitler seized his share of the booty on September 1st when he attacked Poland. The Second World War was under way.

The Germans used about 40 percent of their total air strength in the Polish campaign, some 1,600 aircraft (700 long-range bombers, 400 fighters, 150 divebombers, and 350 reconnaissance planes). The Poles had a little over 750 planes, but only about half of them were in combat units and even those were obsolete. The Polish fighters were not in the same class as the *Luftwaffe's* Messerschmitt 109s and 110s, and since the Poles had no radar and few anti-aircraft

guns, their fighters could not be used economically. The *Luftwaffe* went after the Polish airfields at the outset and within a week had destroyed more Polish planes on the ground than in the air. In short, the airwar in Poland was a romp for the *Luftwaffe*.⁴³

The Russians were flabbergasted at the rapidity of the German advance and had to speed up their own preparations if they were to seize their share of the Polish spoils. Activating the Byelorussian and Ukrainian fronts, the Red Army hit the Poles from the rear on 18 September, covering some 60 miles in the first day. Soviet historians have found it difficult to explain this Russian-Nazi collaboration in the murder of Poland and they have tried to rationalize it by using euphemistic terminology. Their official designation for the invasion is "The Liberation of the Western Ukraine and Western Byelorussia," and the account in the official Soviet history of the Great Patriotic War is replete with such garbage as the forces of the Ukrainian and Byelorussian fronts going to the western borders to protect the lives and property of the local inhabitants and refers constantly to "the liberation activities of the Red Army." Although Soviet accounts say it was a 12-day campaign, actually the Red Army reached the agreed upon line of demarcation by September 21st, a week before the fall of Warsaw; and the rest of the campaign was a mopping-up operation. As for aviation, although the frontal aviation

⁴³Asher Lee, *The German Airforce*, New York, Harpers, 1946, pp. 45-48; *Ist. Veliki, Otech. Voyn. 1941-45*, Vol. I, pp. 201-203.

units assigned to the ground forces flew cover for them, there was no real test of their capabilities because the Germans had already annihilated the Polish armed forces.

A much greater test of the VVS occurred two months later in the Winter War with Finland. The Soviets had been badgering the Finns since 1938 about allowing them to fortify certain islands in the Gulf of Finland and the Finnish relinquishment of some territory near Leningrad. During a conference in Moscow, which lasted from 12 October to 3 November 1939, the Finns refused to bow to the Russian hectoring and Molotov finally stated that it would be up to the military to clarify the situation. On 30 November the Red Army began its attack on Finland to "clarify the situation."

The Soviets made several blunders right at the start. They did not anticipate the difficulties of fighting in a forest-lake environment in the winter; they underestimated, to put it mildly, the fighting ability of the Finnish soldier; even more astonishing, they did not take into consideration the short winter days and the foul weather which at times immobilized their air force; and, finally, they really stirred up Finnish patriotism when they set up a "Democratic People's Government of Finland" in the frontier hamlet of Terijoki, a government headed by Otto W. Kuusinen, a Finnish exile in Moscow for twenty years and a secretary of the Comintern.

The campaign in December was an unmitigated disaster. The overwhelmingly outnumbered Finns held along the Mannerheim Line, which crossed the Isthmus, and even bested the Red Army at Suomussalmi,

where the Russians tried unsuccessfully to slice Finland in two by cutting across from the White Sea to the Gulf of Bothnia. At that point, the end of December, the Soviets regrouped, put Timoshenko in command of the Karelian Front, and, as Erickson so aptly puts it, ". . . at the beginning of 1940 the Red Army began its second war with Finland."⁴⁴

By the end of January, Timoshenko was ready and on February 1st he hit hard against the Mannerheim Line in a drive on Viipuri. Hammering away with masses of men, tanks, artillery and planes, Timoshenko had Viipuri surrounded and the Finns on the ropes by early March. On 12 March the Finns threw in the towel--they had neither the men nor the materiel to continue the unequal struggle. The Red Army had employed 45 rifle divisions, some 1,500 tanks, 3,000 aircraft, and prodigious quantities of artillery.⁴⁵ All this to batter into submission an enemy with 200,000 troops, a little artillery, few anti-tank or anti-aircraft guns, and a tiny airforce whose total strength never reached over 200 planes, only half of which were serviceable.⁴⁶ And the casualties admitted to by the Soviets, about 200,000, were the equivalent of the size of the Finnish Armed Forces.

The VVS, in short, faced a Finnish Air Force that, although doughty,

⁴⁴*The Soviet High Command*, p. 547.

⁴⁵*Ibid.*, p. 552.

⁴⁶Richard Ward and Christopher Shores, *Finnish Air Force 1918-1968*, New York, Arco, 1969, no pagination.

was not equipped quantitatively nor qualitatively to do more than offer a stubborn holding action, a resistance doomed to failure in the face of such numbers. When the war began, the Finns had a total of 145 aircraft, with only a hundred or so airworthy. Their fighter aircraft consisted of 65 Fokker C.Xs, C.Vs, and D.XXIs, 10 Bristol Bulldogs and 15 Blackburn Ripons. Only the Fokkers could be called even adequate to face the Russians. They also had 15 Blenheim I bombers. During the Winter War the Finns received 200 aircraft from foreign countries, but some of them, like the Gloster Gladiator IIs, were not able to cope with the Soviet I-153s and the I-16s. By the end of the war, the Finns had just over a hundred serviceable aircraft to face 2,000 to 2,500 Soviet planes.⁴⁷

The VVS, apparently underestimating the enemy at the beginning of the war, initially assigned only 900 aircraft to the Finnish front, but heavy losses in I-15 and I-15bis fighters as well as SB-2 bombers forced the VVS to double the commitment. The I-153 and I-16 fighters in overwhelming numbers were able to knock the obsolescent Finnish planes out of the sky thus enabling the Soviet bombers, mostly SB-2s and the faster DB-3s, to drop 150,000 explosive and incendiary bombs for a total of 7,500 tons.

The Soviet Air Force was not able, in the early phase of the war, to coordinate its actions with the ground forces thus reducing its effectiveness. As the Finnish Commander-in-Chief, Marshal Mannerheim,

⁴⁷Ward and Shores, *op. cit.*

pointed out, in spite of the Finnish weakness in air power and anti-aircraft defense, the Soviet air force was never able to completely paralyze the Finnish communications.⁴⁸ Although held down by foul weather in December, the Soviet pilots were operating in exceptionally clear weather in January and February, which enabled them to bomb Finnish cities, communications, and fortifications. But, says Mannerheim, ". . . Russian air power was not to prove a factor of decisive importance."⁴⁹ One figure, among a plethora of estimates apropos the losses incurred in the air war, is 240 Soviet aircraft shot down in air-to-air combat and 444 lost through anti-aircraft fire and other causes, for a total of 684. Finnish air losses are given as 62 aircraft.⁵⁰ All in all, the Winter War was hardly a glorious feat of arms for the Red Army in general nor the VVS in particular.

8. VVS ON THE EVE OF THE GREAT PATRIOTIC WAR

The overall miserable performance of the Red Army, including the VVS, in the Winter War was just one more reason for the frenetic activity that characterized the Soviet defense industry in between 1939 and June 1941. Zhukov's candid appraisal of Soviet shortcomings at Khalkhin-Gol, close observation of German efficiency in Poland,

⁴⁸*The Memoirs of Marshal Mannerheim* (Translated by Count Eric Lewenhaupt), London, Cassell, 1953, p. 346.

⁴⁹*Ibid.*, p. 369.

⁵⁰Eloise Engle and Lauri Paananen, *The Winter War*, New York, Scribners, 1973, p. 62.

and then the horrors of the Winter War alerted Stalin to the need for both better organization in the armed forces and for better weapons.⁵¹ Of course, many of the troubles derived from the Purge: for example, the wholesale slaughter of high-ranking officers trained to handle large masses of men with their replacement by junior officers who had yet to learn their trade. Furthermore, even the managers of industrial plants devoted to military output were so scared of being accused of "sabotage," "wrecking," and all the other blanket terms used in the Purge that they avoided all decision-making if at all possible.

Voroshilov, who had not measured up in the war with Finland, was replaced as Commissar of Defense by Marshal S. K. Timoshenko, and Zhukov, fresh from his exploits in Mongolia, became Chief of the General Staff. The new bosses immediately recommended a reorganization of the VVS and in late 1940 work was begun on expanding the school system and on the re-equipment of combat formations with new types of aircraft, all in an effort to come up with an expanded and modernized VVS capable of holding its own against the awesome *Luftwaffe*. But, as Zhukov says in his memoirs, when the Germans attacked, the VVS was in the midst of its reorganization, its pilots not yet fully trained in what new aircraft had come into the inventory, and only 15 percent of them trained for night flights.

⁵¹*The Memoirs of Marshal Zhukov*, New York, Delacorte Press, 1971, p. 203.

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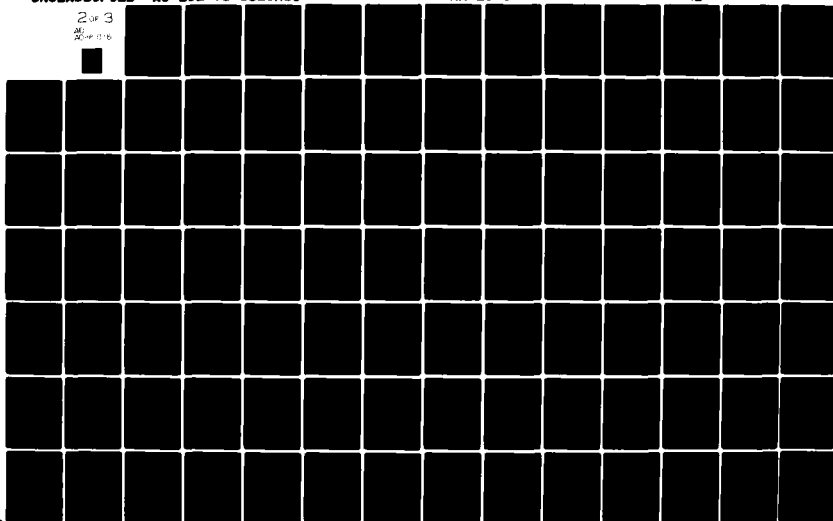
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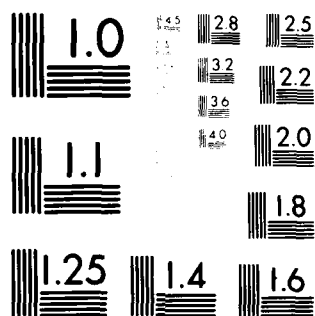
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MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS-1963-A

In January 1940, A. I. Shakurin replaced M. M. Kaganovich as head of the Aviation Industry Commissariat and went to work with a will. According to Shakurin, his job was to accelerate the output of better aircraft at literally breakneck speed, instructions he got from Stalin himself. His job was helped by the completion of the new TsAGI, replete with new laboratories and wind tunnels, an expansion and modernization that had been under way since 1935.

While the VVS was demonstrating its strengths and weaknesses in action on the Khalkhin-Gol, over the plains of Poland, and in the cold and fog of Finland, Soviet aircraft designers proceeded to come up with new types of aircraft ranging from heavy bombers to dive-bombers to fighters.

In 1938 Vladimir M. Petlyakov's design bureau began work on a high-altitude, long-range fighter with a pressurized cabin, the VI-100 (*vysotnyy istrebitel'*, high-altitude fighter). It was a two-seat, mid-wing monoplane powered by two 1,000 hp M-105R engines equipped with superchargers. And then it was decided to make it into a dive-bomber, the PB-100 (*pikiruyushchiy bombardirovshchik*, dive-bomber), somewhat later redesignated the Pe-2. It went into series production in 1940 and over the next five years the Soviet aircraft industry turned out 11,426 Pe-2s. It carried five machine guns and a 3,300 lb bomb load and had a top speed of 335 miles per hour at 16,000 feet.⁵²

⁵²Alexander, *op. cit.*, pp. 295-304; *Aviatsiya i Kosmonavtika*, No. 10 (October 1974), p. 27.

In June 1939 the state tests on Il'yushin's DB-3F (*dal'nyy bombardirovshchik*, long-range bomber--the F stood for *forsirovanniy*, boosted or supercharged) were completed and production begun. It was in service with the VVS in 1940. Later redesignated the Il-4, it was widely used in the Great Patriotic War. The Il-4 had two 1,100 hp M-88B engines, a maximum speed of 265 mph at 20,000 ft., and a range of around 2,000 miles. It became the backbone of the Long-Range Air Force during WWII and 5,256 were built between 1940 and 1944.⁵³

In 1940 three new fighters went into series production: the MiG-3, the Yak-1, and the LaGG-3. And in 1941 the famous Il-2 *Shturmovik* began to come into the service. These four aircraft were to be produced in large numbers during World War II.

The team of Artem I. Mikoyan and Mikhail I. Gurevich began to develop a new fighter, the MiG-1, in 1938. In a test flight on 24 May 1940 the new plane attained a maximum speed of slightly over 400 mph at 22,000 ft. By August the MiG-1 was in production. It was powered by a 1,350 hp liquid-cooled 12-cylinder AM-35 engine, the most powerful Soviet engine available at that time. The aircraft had such poor handling qualities that Mikoyan and Gurevich got back to the drawing board and began to redesign the plane. The result was the MiG-3 which came into service in early 1941. Altogether, 100 MiG-1s and 3,322 MiG-3s were built in the 1940-1941 period.

⁵³Alexander, *op. cit.*, pp. 86-93.

Although, as Alexander points out, the MiG-3 was a match for the best Luftwaffe fighters above 16,000 feet, below 13,000 feet the Germans had the advantage.⁵⁴

Yakovlev's I-26 or Yak-1 was influenced by the British Spitfire and the German Me-109R, both of which he had seen in visits to England and to Germany. The prototype of the Yak-1 went on its first flight test in January 1940 and was put in series production in May of that same year. It was in the flypast over Red Square in November. A low-wing monoplane powered by an M105P (P for *pushka*, cannon) engine which developed 1,050 hp, the Yak-1 had a top speed of around 400 mph at 20,000 feet. During World War II, the Soviets produced 8,721 Yak-1s.⁵⁵

The LaGG-3 was the product of a three-man team of designers: Semen A. Lavochkin, Vladimir P. Gorbunov, and Mikhail I. Gudkov. The initial prototype in 1938, LaGG-1, was less than adequate for the state acceptance test in March 1940 and the team went to work on an improved version, the LaGG-3. The plane was in series production by early 1941 and in the two years it was in production (1941-42) 6,528 were turned out. It was a low-wing monoplane with the same short fuselage that characterized most of the fighters turned out in the decade of the 1930s. The LaGG-3 was powered by an M-105P engine which developed 1,100 hp. Its top speed was about 335 mph, although

⁵⁴ *Ibid.*, pp. 193-95.

⁵⁵ *Ibid.*, pp. 421-24; *Aviatsiya i Kosmonavtika*, No. 11 (November 1974), pp. 24-25.

an improved engine boosted it to 385 mph in 1942.⁵⁶

The famous Il-2 *Shturmovik*, or Stormovik, was designed by Il'yushin between 1938 and 1940 under the designation of BSh-2 (*bronirovannyi shturmovik*, armored ground-attack). Upon completion of the state acceptance trials in March 1941, the aircraft went into production, entering service in limited numbers in July of that year. The original single-seat version was very vulnerable to attack from the rear and in 1942 it was decided to make the plane into a two-seater in order to accommodate a rear gunner. Mikulin came up with a better engine, the AM -38 with 1,600 hp and this boosted the Il-2's capability. Its armament consisted of two 23mm cannons (replaced with 37mm cannons in 1943), two 12.7 machine-guns, eight RS-82 rockets or 13,000 lbs of bombs. Its top speed was 280 mph at 8,000 feet. In addition, it was heavily armored. Altogether, over 36,000 Il-2s were produced between 1941 and 1944.⁵⁷ It became one of the most celebrated Soviet aircraft in the Great Patriotic War and the tank-destroyer par excellence.

According to Shakurin, in the second half of 1940 all the old fighters were taken out of series production. Since by that time there were 28 aircraft, 14 engine, and 32 aircraft component factories in operation, Shakurin had every right to anticipate a VVS adequately

⁵⁶Nowarra and Duval, *op. cit.*, pp. 136-37; Alexander, *op. cit.*, pp. 163-67.

⁵⁷*Aviatsiya i Kosmonavtika*, No. 10 (October 1974), p. 27; Alexander, *op. cit.*, pp. 94-99.

equipped with modern machines within the next few years.⁵⁸ Marshal Zhukov, in his memoirs, says the Red Army received 17,745 combat planes, including 3,719 of the latest types, between January 1939 and 22 June 1941, a little over 7,000 aircraft a year.⁵⁹ Unfortunately for the VVS, the overwhelming bulk of the aircraft it received was obsolescent since the newer types did not begin to flow into combat units until early 1941, just before the Nazis destroyed most of them on the ground.

⁵⁸A. I. Shakurin, "Aviatsionnaya Promyshlennost' Nakanune Velikoy Otechestvennoy Voyny" (The Aviation Industry on the Eve of the Great Fatherland War), *Voprosy Istorii*, No. 2, 1974, pp. 81-99.

⁵⁹*The Memoirs of Marshal Zhukov*, p. 201.

CHAPTER III

THE SOVIET AIR FORCES IN THE GREAT FATHERLAND WAR

In spite of Soviet propaganda to the contrary, Stalin's main reason for signing the Soviet-Nazi Pact in August 1939 was a Machiavellian one: he hoped the Nazis would batter themselves into a weakened condition against the French and British and leave the Soviet Union the arbiter on the continent of Europe. While the Germans were engaged in mortal combat, Stalin felt that he could build up a bulwark of Soviet-controlled territories between the German sphere of influence and his own national boundaries and gain time in which to reorganize and re-equip the Red Army after its sad experience in the Winter War with Finland.

The actual events belied Stalin's expectations. Germany knocked France out of the war in a little over a month in May and June 1940, and, when Russia's turn came a year later, the Nazis cut through the non-Soviet "bulwark" with ease and were 500 miles into the Soviet Union itself within three weeks. The reorganization and reequipment of the Red Army during the 22 months respite gained by the August 1939 agreement seems to have been woefully inadequate. Even the Soviets, during the war, admitted to 4 1/2 million casualties during the first year of the war. In fact, Stalin's intrigue with Hitler cost the Soviet people enormously in blood and property, and the wily Georgian seems to have been outrageously flim-flammed by the ex-house painter from Austria. It was only when the Stalin version of the events came

to be written in the postwar period that his great wisdom in signing the pact in 1939 was held up for public admiration.

9. STALIN AND HITLER JOCKEY FOR POSITION (1939-1941)

In early April 1940, Hitler's forces occupied Denmark and successfully invaded Norway, thus insuring the Nazi northern flank on the European continent. On 10 May, the Germans opened their offensive against the Netherlands, Belgium, Luxemburg, and France. Moving in accordance with a plan submitted by von Manstein, the Nazi Panzers broke through the hinge of the French defense at Sedan, raced for the Channel, which they reached by 21 May, and staggered their opponents so badly that the rest of the campaign, up to the French bid for terms on 16 June, was more a gigantic mopping-up operation than a war. By mid-June 1940, only Great Britain remained undefeated, and Hitler had every confidence that it would soon see the light and capitulate.

The speed and efficiency of the German conquest in the Low Countries and France jolted the Soviet leaders badly, and they began a desperate effort to expand as far geographically to the west as possible without actually coming into open hostilities with Hitler. During June and July 1940, Estonia, Latvia, and Lithuania were blackmailed into submission, changed their governments to comply with Soviet demands, and were incorporated into the USSR as new Soviet Republics with the Red Army in complete occupation. On 23 June, Molotov informed the Germans that the Soviet Union, in accordance with the secret protocol of August 1939, was about to take over

Bessarabia from Rumania, and, on 28 June, the Red Army marched in, adding the Rumanian territory of Northern Bukovina to the booty on the pretext that it had a Ukrainian population.

The Soviet move in Rumania angered Hitler exceedingly--he resented Soviet aspirations in the Balkans, seeing in them evidence of Soviet perfidy. He began a series of counter moves in that area to check the Soviet influence. In the fall of 1940, German troops were sent into Rumania, ostensibly to protect the Ploesti oil fields, and, by February 1941, there were almost 700,000 German soldiers in the country. Furthermore, Hitler began to play the role of arbiter in the Balkans, transferring the southern Dobrudja from Rumania to Bulgaria and playing off Hungary against Rumania by allotting much of the long-disputed Transylvanian region to Hungary, much to the chagrin of Bucharest. Soviet-German rivalry in the Balkans grew bitter during the second half of 1940 and early 1941.

Molotov visited Berlin in November 1940 in an attempt to establish some clearer lines of Soviet and German influences in the disputed areas, and Hitler, acting in his most grandiose manner, tried to steer Russia toward "its traditional line of expansion," in the direction of the Persian Gulf. But Molotov, the epitome of practicality, demanded specific agreements, such as a free hand for the Soviet Union in Finland, the acceptance of Russian hegemony in Bulgaria, and fulfillment of Russia's aspirations in the Turkish Straits. Hitler's response to Molotov's intransigence was to issue secretly, of course, the directive for Operation Barbarossa, the invasion of Russia on 18 December 1940.

In November 1940, Hitler persuaded Hungary, Rumania, and Slovakia to join the Rome-Berlin-Tokyo Axis, originally signed by the big three in September 1940, and, in March 1941, Bulgaria joined the Axis. The Yugoslavian government also signed in March 1941, but a coup in Belgrade deposed the government friendly to Hitler, and the new regime refused to abide by its predecessor's commitment. Hitler, furious at such display of defiance, attacked Yugoslavia, at the same time invading Greece to extricate his buddy, Mussolini, from the mess that had resulted from his unilateral decision to attack Albania and Greece. A Greek counter attack had Mussolini's legions on the run, and he needed German support badly. All this German activity in the Balkans threw Barbarossa off schedule by a month, and the invasion planned for May had to be put off until June 1941.

In the meanwhile, Stalin was dickering with the Japanese for an agreement along the Far Eastern borders, and Matsuoka came to Moscow in April 1941 to sign a Soviet-Japanese neutrality pact with Stalin. This was a tremendous relief to the Soviets as it lessened the danger of a two-front war if the Germans attacked. In this respect, Stalin was one up on Hitler, who, still at war with England, was about to embark on a war with Russia, thereby embroiling Germany in its classic nightmare, the two-front war. But Hitler was confident that he could finish off the Red Army in the summer of 1941, insure food and oil from the East, and then concentrate on England with no worries about a wily Stalin in his rear. The Nazi *Blitzkriegs* in Poland and France, plus the miserable performance of the Red Army

in the Winter War with Finland, convinced Hitler and even his reluctant General Staff that the *Blitzkrieg* in Russia was feasible.

On 18 December 1940, Hitler issued Directive No. 21 (in 9 copies), the infamous "Case Barbarossa," which described the strategy involved in the coming attack on the Soviet Union, originally set for mid-May 1941 but subsequently moved up to 22 June because of involvement in the Yugoslavian-Greek campaign. The "General Intention" of the directive was as follows:

The bulk of the Russian Army stationed in Western Russia will be destroyed by daring operations led by deeply penetrating armoured spearheads. Russian forces still capable of giving battle will be prevented from withdrawing into the depths of Russia.

The enemy will then be energetically pursued and a line will be reached from which the Russian Air Force can no longer attack German Territory. The final objective of the operation is to erect a barrier against Asiatic Russia on the general line Volga-Archangel. The last surviving industrial area of Russia in the Urals can then, if necessary, be eliminated by the Air Force.

In the course of these operations the Russian *Baltic Fleet* will quickly lose its bases and will then no longer be capable of action.

The effective operation of the Russian *Air Force* is to be¹ prevented from the beginning of the attack by powerful blows.

The rest of the directive is concerned with the conduct of operations, the deployment and objectives, and the allies available to lend a helping hand.

¹Text of "Case Barbarossa" in *Blitzkrieg to Defeat: Hitler's War Directives, 1934-1945*. (Edited, with an Introduction and Commentary by H. R. Trevor-Roper), New York, Holt, Rinehart, and Winston, 1964. pp. 49-52.

10. THE WEHRMACHT VS. THE RED ARMY: THE LINE-UP IN JUNE 1941

German Forces. By 22 June, the Germans had their forces deployed along the entire western frontier of the USSR from the northern end of Finland to the mouth of the Danube in Rumania. The offensive was to be a three-pronged advance in the general directions of Leningrad, Moscow, and Kiev, with subsidiary offensives from Finland and Rumania.

Army Group North, commanded by Field Marshal Ritter von Leeb, included the 16th and 18th Armies, plus a Panzer army under Colonel General Hoepner, composed of two Panzer corps under General Reinhardt and von Manstein. This force was to overrun the Baltic states and attack Leningrad. The Finnish Army, backed by 4 German divisions, was to hit Leningrad simultaneously with von Leeb's assault on the city.

Army Group Center, commanded by Field Marshal Fedor von Bock, was made up of the 4th and 9th Armies, plus two Panzer armies under Hoth and Guderian. This was a formidable force of 50 divisions, including 9 Panzer and 7 motorized divisions. Its job was to hit out toward Smolensk with its eventual target being Moscow.

Army Group South, under Field Marshal Gerd von Rundstedt, included the 6th and 17th Armies and a Panzer army commanded by von Kleist. It also included some satellite forces: Italian, Hungarian, Slovak, and Croatian. Its target was Kiev and then on to the Donets Basin in compliance with Hitler's wish to insure the Ukrainian wheat basket and industrial capacity for future German use.

To the south of von Rundstedt's Army Group South was a German-Rumanian Army made up of the German 11th Army under General von Schobert and the Rumanian 3rd and 4th Armies under Antonescu. This force was to hit the Soviet flank from the south, thus assisting von Rundstedt and then moving toward Odessa.

All told, the Germans and their allies had deployed around 160 to 170 divisions along the Soviet border.

Each German Army Group was backed by an Air Fleet (*Luftflotte*). The 1st Air Fleet (430 combat aircraft) supported Army Group North. The 2nd Air Fleet (910 combat planes) was attached to Army Group Center, and Army Group South had the 4th Air Fleet (600 combat machines). In addition, the 5th Air Fleet (60 combat aircraft) was attached to Army Command Norway for action along the Soviet-Finnish border from Petsamo to Lack Ladoga.² This total of 2,000 combat aircraft does not include 1,270 transport and liaison planes plus those attached to the army units. If those are added to the combat total, then the ensuing 3,270 aircraft total for the Germans plus the 1,000 Finnish and Rumanian planes, i.e. 4,270 planes, is not too far from the official Soviet estimate of "nearly 5,000 aircraft, including about 1,000 Finnish and Rumanian planes, on the western frontier of the USSR."³

²H. Plocher, *The German Air Force Versus Russia, 1941* (edited by H. R. Fletcher), USAF Historical Division, A.S.I., Air University, 1965, pp. 30-35.

³*The Soviet Air Force in World War II* (edited by Ray Wagner and translated by Leland Fetzer), New York, Doubleday, 1973, p. 26; Chief

The Soviet forces facing the Germans, although seemingly unaware of that fact, were stretched from Murmansk to the Black Sea in the recently acquired Bessarabia and grouped in five main commands. In the north, the Leningrad Military District, commanded by Lt Gen M. M. Popov, included the 7th, 14th, and 23rd Armies, with some separate units defending the conquered Finnish territory. It had a total of 19 Rifle divisions and some armor. The Special Baltic Military District, under Col Gen F. I. Kuznetsov, was made up of the 8th, 11th, and 27 Armies, with a total strength of 28 Rifle divisions, 3 mechanized corps, and 4 Cavalry divisions, plus a force of 1,000 tanks to defend the Baltic coast to East Prussia and some 190 miles of frontier with East Prussia. The Special Western Military District, commanded by Army General D. G. Pavlov, late tank expert in Spain, was comprised of the 3rd, 4th, and 10th Armies, backed by a second echelon of forces made up of the 13th, 16th, 20th, 21st, and 22nd Armies, a total of 32 Rifle divisions, 8 mechanized corps, and 6 Cavalry divisions. The Western District was entrusted with the defense of 300 miles of frontier. The

Marshal of Armored Forces P. A. Rotmistrov in his *Istoriya Voenmogo Iskusstva (History of Military Art)*, 2 Vols, Moskva, Voennoe Izdatel'stvo Ministerstva Oborony SSR, 1963, in Vol II, pp. 42-43, gives a much higher figure for the German air strength. He puts the 1st Air Fleet (attached to von Leeb) at 1070 aircraft, the 2nd Air Fleet (with von Bock) at 1670 aircraft, the 4th Air Fleet (with von Rundstedt) at 1,300, with Rumanian air units included, and the 5th Air Fleet in Finland at 900 aircraft with the Finnish Air Force included. Thus, he gets a total of 4940 aircraft available for use in the German offensive in June 1941.

Special Kiev Military District, under Col Gen M. P. Kirponos, was a powerful group composed of the 5th, 6th, 12th, and 26th Armies and a large amount of armor--much more than that available to von Rundstedt, his opponent. Finally, the Odessa Military District had the 9th and 18th Armies plus the 9th Independent Rifle Corps in the Crimea and was commanded by Army General I. V. Tyulenev.⁴

The total strength of the Red Army along the Western border is difficult to estimate with any degree of exactness. The Germans originally calculated on 155 Soviet divisions, but by June 21, 1941, they had increased their estimate to 213 divisions plus 37 mechanized brigades.⁵ Somewhere around 200 divisions, and over 4 million soldiers, is probably near enough to the actual facts.⁶

But many of the Soviet divisions were below strength, some very much so. The only ones at peak combat readiness were the so-called "covering divisions" right on the border, some 40 Rifle divisions and 2 Cavalry divisions, according to Rotmistrov, defending a line over 1,200 miles long.⁷

⁴The Soviet order of battle in June 1941 can be found in the following: *Ist. Velik. Otech. Voyn. 1941-45*, Vol. I, pp. 371-74; Erickson, *op. cit.*, pp. 589-91 gives a table summarizing the material in the Soviet work cited above; Rotmistrov, *op. cit.*, Vol. II, pp. 52-55.

⁵Halder, *Diary*, Vol. VI, entries for April 4 and June 21, 1941.

⁶Khrushchev, January 1960, stated that the Red Army had 4,207,000 men in 1941. *Pravda*, January 15, 1960.

⁷Rotmistrov, *op. cit.*, Vol. II, p. 54.

Before his murder in 1937, Tukhachevsky had outlined a defense plan for the Western frontiers in case of a war with Germany, and, in spite of the ill repute into which he fell as a result of his conviction for treason, much of his thinking dominated the Soviet defense planners right down to the outbreak of hostilities. But the acquisition of new areas as a result of the deal made with Hitler made his thinking obsolete. A relatively strong fortified line, the Stalin Line, had been built, a line stretching from Narva on the Baltic coast to Odessa on the Black Sea. It was not a continuous fortified line, but an intermittent series of fortified points. In 1940-1941, however, Soviet forces were moved out of the fortified zones into the recently seized regions, and were thus deployed in unfriendly areas with little in the way of defense works. This deployment was made to order for the Germans as it facilitated their plan to encircle and annihilate as much of the Red Army as possible in the opening weeks of the war.

The strength of the VVS in the western regions facing the Germans is even harder to ascertain than that of the *Luftwaffe*. German intelligence, in February 1941, came up with an estimate of 5,700 Soviet aircraft in Western Russia. That total was broken down into the following deployment: 1,155 for the Leningrad Military District, 630 for the Baltic M.D., 1,430 for the Western M.D., 1,085 in the Kiev M.D., 560 in the reserves stationed in the Moscow and Orel Military Areas, and 840 in the Military Areas of Odessa,

Kharkov, and the Transcaucasus.⁸ Raymond Garthoff, however, points out that as early as 5 October 1941, A. S. Shcherbakov, an alternate member of the Politburo, was quoted in *Pravda* as admitting Soviet aircraft losses of 5,316.⁹ This leads Garthoff to conclude that Soviet aircraft losses in the summer of 1941 probably totaled around 8,000 planes and since they had 2,500 still flying at the end of the year, the figure of 10,000 aircraft is a good one for 22 June 1941.¹⁰

The Germans soon realized, however, that they had underestimated the numerical strength of the VVS as General Halder noted in his war journal as can be seen from the following extract:

The Air Force has greatly underestimated the numerical strength of the enemy. It is quite evident that the Russians initially had far more than 8,000 planes. Half of this number probably has already been shot down or destroyed on the ground, so that numerically we now are about equal with the Russians. But Russian flying efficiency cannot nearly compare with ours, owing to the poor training of their pilots and crews, and that is why entire enemy squadrons, or large parts of them, get shot down so often in combat, as, for instance, happened yesterday over Dvinsk and Bobruisk.¹¹

The VVS, quantitatively superior to the *Luftwaffe* on the Western front, was in bad shape qualitatively. The newest types (MiG-3, Yak-1, LaGG-3, and Il-2) were just starting to trickle into the combat

⁸ Generalleutnant Walter Schabedissen, *The Russian Air Force in the Eyes of German Commanders*, USAF Historical Division, R.S.I., Air University, 1960, p. 19.

⁹ Raymond Garthoff, *Soviet Military Doctrine*, p. 503.

¹⁰ *Ibid.*, p. 429.

¹¹ The Private War Journal of Generaloberst Franz Halder, Entry for 1 July 1941, Vol. VI, p. 190.

units. Thus, the major part of the VVS inventory, over 80 percent, was made up of obsolescent planes inferior to the *Luftwaffe's* best, especially the Messerschmitt 109 fighter.¹² Furthermore, few of the Soviet pilots had learned to handle the new types of aircraft then coming into the inventory, while their *Luftwaffe* rivals had been trying out their top aircraft in the Spanish Civil War, in Poland, and against the British and French. And both the pilots and the aircraft were good, especially the Me-109.¹³

According to Marshal Zhukov, in February 1941 the Central Committee and *Sovnarkom* ordered the construction of 190 new airfields in the western areas, but most of them were uncompleted when the war broke out. The VVS was in the midst of reorganization, only 15 percent of the pilots were trained in night flying, and the air force commanders were so engrossed in training personnel to handle the new equipment that they failed to keep the old equipment ready for combat. As the good Marshal complains: "Our Air Force could have been fully re-equipped and made much stronger in a mere year or a year and a half, but for the war."¹⁴

¹²*Ist. Velik. Otech. Voyn. 1941-45*, Vol. I, p. 476; the Germans estimated that less than 20 percent of the VVS planes in the Western region were new-type aircraft. See Erickson, *op. cit.*, p. 583. Zhukov, *Memoirs*, p. 202, says 21 percent re-equipped.

¹³The Messerschmitt 109 will be referred to hereafter as the Me-109, named after its designer, Dr. Messerschmitt, although the usual German designation for the plane is Bf-109 (*Bayerische Flugzeugwerke*, Bavarian Aircraft Plant). See Thomas H. Hitchcock, *Messerschmitt "O-Nine" Gallery*, Acton, Mass., Monogram Aviation Publications, 1973, *passim*.

¹⁴*Memoirs*, p. 203.

Thus on the eve of the launching of "Barbarossa," the VVS was in a mild state of confusion because of reorganization jitters, was loaded with obsolete planes, and was in the midst of re-equipping its combat units with new types of aircraft and re-trained pilots. The *Luftwaffe*, however, as the authors of the Soviet history of the air war in Russia put it, possessed entirely modern aircraft, a large aircraft industry to produce these planes, and fliers, who, for the most part, had battle experience.¹⁵ Although a slightly exaggerated description of the *Luftwaffe*, in an attempt to make the subsequent Soviet debacle look a little more inevitable, nevertheless, it is not a bad summary of the difference between the two air forces on the eve of the Great Patriotic War.

11. SOVIET DEBACLE: THE SUMMER OF 1941

The last trainload of Soviet grain crossed the bridge over the Bug River into German-controlled Poland at 0200 on the 22nd of June, an hour and a half before the German attack on Russia was scheduled to begin. During the 22 months of the Pact, Stalin had sent Hitler over 1 1/2 million tons of grain, almost a million tons of petroleum, 2,700 kilograms of platinum, as well as sizeable quantities of manganese, chrome, and cotton, while the Germans had shipped a half a million marks of manufactured goods, mostly machinery, to Russia, but Hitler was far behind in this exchange when he launched his legions into the Soviet Union. It was one way of getting out of

¹⁵ *The Soviet Air Force in World War II*, p. 29.

paying a debt, although a bit hard on the creditor. At 0315 on 22 June the Germans struck and the *Blitzkrieg* into Russia was under way. The three-million-man Wehrmacht rushed forward in an attempt to annihilate the four-million-man Red Army in the greatest military struggle in history.

The Red Army, unprepared for the attack, its aircraft still on the ground, with no plan for a coherent defense, and unable to get sensible directions from Moscow, was caught flat-footed--a huge, vulnerable dinosaur with its tiny brain temporarily short-circuited. Stalin had been taken. Right down to the very moment of the attack, he had remained oblivious to all warnings about the imminence of the German offensive, and there had been plenty of warnings. Both the United States and Great Britain not only warned Stalin, but even supplied an accurate date for the coming attack. Dr. Sorge, a Soviet spy close to the German ambassador, Ott, in Tokyo, informed Moscow of the timing of Barbarossa, and the Soviet espionage network in Switzerland, notable for the accuracy of its information, had supplied similar information. The Red Army's own intelligence was aware of the German build-up along the border, and also cognizant of a radical increase in German reconnaissance flights over Soviet territory. All these warnings and indicators left Stalin unmoved; he was confident that he had lots of time before Hitler would violate the Pact, and he was also terribly suspicious that the warnings were British attempts to embroil him in a conflict with Germany. Even during the first few hours of the conflict, Stalin refused to

believe that it was all-out war. His paranoiac suspicion of Churchill cost Russia dearly.

The Germans, in late June and early July, followed the strategy laid down in Barbarossa—to encircle and to annihilate the Red Army west of the Volga. Although the three thrusts by Army Groups North, Center, and South were aimed at Leningrad, Moscow, and Kiev respectively, the cities were incidental and the destruction of the Soviet military forces paramount.

The role of the *Luftwaffe* was spelled out clearly in Hitler's *Operation Barbarossa*:

The Air Force will be charged with the responsibility to paralyze insofar as possible the activities of the Russian Air Force and put it out of commission, and to support the operations of the Army at its points of main effort, particularly in the Army Group Center area and along the north wing of Army Group South. According to their significance for the course of the campaign, the Russian railways will be severed by air attacks. The most important railroad installations (river crossings!) will be seized by bold operations by parachute and airborne troops. The [Soviet] armament industry should not be attacked during the major operations in order to be able to concentrate all *Luftwaffe* elements against the enemy air force and for the direct support of the Army. Strategic attacks, particularly against the Ural region, are advisable only after the mobile operations have been concluded.¹⁶

Luftwaffe in Control. The *Luftwaffe*, already on the way to its targets before the first artillery barrage, caught the Soviet aircraft sitting on their airfields and tore the guts out of the Red Air Force in the first hours of the invasion. In the first 48 hours of the conflict, the Soviets may have lost 2,000 planes,

¹⁶Quoted in Plocher, *op. cit.*, p. 281.

as many as the *Luftwaffe* had on the whole front,¹⁷ This was a great help to the Panzer leaders as they could operate deep behind the Russian fronts with little hindrance from Soviet aircraft and call on their air force for close support when they got in a tight spot. The closely coordinated tank-air operation was working in Russia just as it had in the Low Countries and France.

The German pilots, having the advantage of complete surprise plus favorable weather, were able to fly continuous high-altitude and low-level attacks on Soviet airfields. The few Soviet planes that did manage to get into the air were immediately shot down. *Luftwaffe* bombers flew up to six missions a day, while the dive-bombers and fighters flew up to eight. Since the Soviet aircraft were lined up on the airfields in rows with no protection, the German pilots had perfect targets to aim at. The carnage was almost unbelievable. According to a German account, the first wave of 637 bombers and 231 fighters was directed at Soviet airfields,¹⁸ and even the official Soviet account has 1,000 German bombers attacking 66 Soviet airfields with a loss of 1,200 Soviet aircraft, 800 of that number on the ground.¹⁹ The German High Command reported the destruction of just over 4,000 Soviet aircraft

¹⁷Erickson, *op. cit.*, p. 593; the Soviets (*Ist. Velik. Otech. Voyn. 1941-45*, Vol. II, p. 16) admit that in the first day the *Luftwaffe* attacked 66 airdromes along the frontier on which were parked the newest types of fighters and some 1500 Soviet aircraft were destroyed either on the ground or in combat.

¹⁸Flocher, *op. cit.*, p. 41.

¹⁹*Soviet Air Force in World War II*, p. 35.

by June 29th, i.e. a week after the start of the offensive.²⁰ The Soviet and German figures for kills and losses are unreliable at best and the discrepancies sometimes border upon the ludicrous, but even the Soviets admit the almost unbelievable havoc wrought by the *Luftwaffe* in the opening days of the German offensive.

Poorly organized anti-aircraft defense, inferior planes, inexperienced pilots, and utter confusion in the upper echelons of command--all these factors combined to make Soviet efforts to counter the *Luftwaffe* onslaught futile. The Soviet I-153s and I-16s were not in the same league with the German Messerschmitt 109s. About all the Soviet fighters and dive-bombers could do in the summer of 1941 was to try to give some assistance to the Soviet ground forces. This assistance even included ramming the enemy aircraft when all else failed. The Soviet accounts are studded with stories of heroic fliers who rammed German aircraft or else, like Captain N. F. Gastello, flew their burning planes into German troop concentrations or at German trains.²¹ Furthermore, the Soviet DBA, or Long-Range Bombardment Aviation, equipped with Il-4s and obsolete TB-3s was unable to hamper the German offensive by striking deep behind the lines. And soon, because of dreadful situations on the ground, Long-Range Aviation was used for close-support operations, which was hardly the most efficient use of the

²⁰Plocher, *op. cit.*, p. 41.

²¹*Soviet Air Force in World War II*, p. 44.

DBA.²²

According to Field Marshal Kesselring, commander of the *Luftwaffe's* 2nd Air Fleet, the German pilots achieved "air superiority" two days after the opening of hostilities and he goes on to describe the massacre of Soviet medium bombers as they arrived over German targets at regular intervals and were shot down with ridiculous ease by the German fighters.²³

Without air support, either tactical or strategic, the Red Army was at the mercy of the *Luftwaffe* and the German Panzer Groups could operate deep behind the Russian fronts with little hindrance from the VVS and could call upon their own air units when they got in a tight spot. Von Leeb's Army Group North, spearheaded by Hoepner's 4th Armored Group, slashed into the Baltic states and by the end of August Leningrad was under siege by the Germans to the south and east and the Finns in the north. Army Group Center, headed by Hoth's 3rd Armored Group and Guderian's 2nd Armored Group, in gigantic pincer movements, was able to trap three Soviet armies and four mechanized corps, with 287,000 prisoners and 1,450 guns as booty,

²²Up to March 1942, the Soviet long-range bombing force was called *Dal'nyaya bombardirovochnaya aviatsiya* (Long-Range Bombardment Aviation), or DBA; up to December 1944 it was named *Aviatsiya dal'nego deystviya* (Aviation of Long-Range Operations), or ADD; from then until 1946 it was the 18th Air Army, and from 1946 on it has been designated simply *Dal'nyy Aviatsiya* (Long-Range Aviation), or DA. The "long-range" part of the designation, whether for DBA, ADD, or the 18th Air Army, was until 1945 a relative term since the inventory included more medium-and short-range bombers than really long-range ones. See A. Tsykin, "Taktika Dal'ney Bombardirovochnoy Aviatsii v Letne-Osenney Kampanii (1941 goda)" (Tactics of Long-Range Bombardment Aviation in the Summer-Fall Campaign [1941]), *Voenno-Istoricheskiy Zhurnal*, No. 12 (December 1971), p. 65.

²³Plocher, *op. cit.*, p. 42.

by the end of the second week. By the 25th day, on 16 July, Smolensk had fallen to the Germans--they had covered two-thirds of the 600 miles to Moscow.²⁴ But von Rundstedt's Army Group South, headed for Kiev and points southeast, ran into trouble by the last week in August. Guderian's Panzer Group was detached from Army Group Center and sent south to aid von Rundstedt. The result was one of the greatest "round-ups" of World War II, some 665,000 Russians with 3,718 guns and 884 armored vehicles were captured when von Kleist's and Guderian's Panzers closed the trap on the Russians on 16 September, and Kiev fell three days later.²⁵ The Soviets claim that the enemy had 1,150 planes in the battle for the Ukraine, while they had almost as many, but 75 percent of them were obsolete. The VVS, according to the Russian version, flew over 26,000 sorties during the August-September fighting in the Kiev and Black Sea area.²⁶ Plocher, however, points out that the *Luftwaffe* had air superiority during the whole of the Ukrainian campaign and was able to prevent "any serious Soviet air

²⁴Paul Carell, *Hitler Moves East, 1941-1943* (translated by Ewald Osers), Boston, Little, Brown, 1964, p. 74.

²⁵Carell, *op. cit.*, p. 127; in *Ist. Velik. Otech. Voyn, 1941-45*, Vol. II, p. 111, the Soviet authors claim that they had only 677,085 troops on the Southwestern Front, after the battle some 150,541 remained, and large numbers were killed in the conflict, thus making the German figure absurd.

²⁶*Soviet Air Force in World War II*, pp. 60-63.

interference with German ground forces"; the *Luftwaffe* carried out "virtually undisturbed attacks against Russian troops and materiel in the pocket."²⁷ The magnitude of the German victory would seem either to support Plocher's version or demonstrate the ineffectiveness of 26,000 Soviet sorties.

By the end of September, Hitler became enthused about a renewal of the drive on Moscow by Army Group Center. The campaign began well with a great double encirclement of the Soviet forces in the Vyazma-Bryansk pocket. According to German figures, the Russians lost another 600,000 men, 1,242 tanks, and over 5,000 guns.²⁸ While the infantry mopped up the Russians trapped in the pocket, the Panzers pushed ahead: Kaluga, 100 miles southwest of Moscow, fell on 13 October, and Kalinin, 93 miles northwest of the capital was taken on the 14th. The main German forces reached Borodino, site of Napoleon's great battle before Moscow in 1812, and it was here that the Germans for the first time came up against the Russian ace-in-the-hole, Siberian units brought in from the Far Eastern frontier and T-34 tanks used in mass for the first time. The Germans pushed through, but at a frightful cost. By 19 October,

²⁷Plocher, *op. cit.*, p. 127.

²⁸The German figures are probably exaggerated; the various Soviet sources differ considerably on the extent of the losses in the Vyazma-Bryansk debacle--but all give much lower figures than do the Germans. See Alexander Werth, *Russia At War, 1941-1945*, New York, Dutton, 1964, pp. 230-231 for Russian estimates. Erickson (*The Road to Stalingrad*, Vol. I, New York, Harper & Row, 1975, p. 219) points out that since the Russians could only muster 90,000 men in the Mozhaik defense sector, the main defense line after the debacle, the Soviet losses must have been desperate as they had 800,000 men when the battle began (p. 213).

the Germans took Mozhaysk, 60 miles away from Moscow. The defeat at Borodino and the capture of Mozhaysk caused a panic in Moscow between 16 and 19 October. Party officials, bureaucrats, and police joined in with lesser folk in mass flights from the capital in an attempt to find safety in the east. Then came the rains and the advance was stopped dead in its tracks--not so much by the Russians as by mud, bottomless bogs that could not be negotiated by wheeled vehicles or even tanks. There was nothing to do but wait until it became cold enough to freeze the ground to get the German armada moving again.

The figures given in the official Soviet account of the air war in Russia for the first four months, i.e. up to the October pause in the German drive on Moscow, are 250,000 sorties, mostly against German tank and motorized troops, and the destruction of 3,500 enemy aircraft.²⁹ The Soviet estimate of German losses is undoubtedly on the high side; but even using the Soviet figures, the *Luftwaffe* comes out very well in comparison with the VVS losses in the summer and fall of 1941.

The *Luftwaffe*, however, was down to 2,000 aircraft by early November as some units had been withdrawn for rest and repair after four months of intensive effort, and other units had been transferred to the Mediterranean and West European fronts in an effort to cope with the growing U.S.-British threat.³⁰ Furthermore, as the *Luftwaffe's*

²⁹*Soviet Air Force in World War II*, p. 67.

³⁰Asher Lee, *The German Air Force*, p. 117.

strength on the Russian front was thinning out in late 1941, the Soviets were getting new and better planes. As was to be demonstrated in the battle of Moscow in November-December, the days of overwhelming *Luftwaffe* air superiority were numbered.

12. THE BATTLE FOR MOSCOW

Until the German drive on Moscow was stalled by weather in late October, the Red Army had reeled from disaster to catastrophe on all fronts from the Baltic to the Black Sea. It lost most of its tanks; its air arm was down to 25 percent of the machines it had in June; and the Germans had captured millions of prisoners. To make matters worse, over half of the Soviet industrial base had been overrun by the Nazis. Time, however, could be on the side of the Soviets if they could hold out until Father Winter arrived. German logistics had become a nightmare as the *Wehrmacht* pushed deeper into Russia and the partisans in the German-occupied areas were getting bolder and nastier. The simple fact was that as the German supply lines lengthened, those of the Red Army shortened. Furthermore, the United States and Great Britain were promising generous aid in the near future.

As early as May 1941, Stalin had taken unto himself the chairmanship of the Council of People's Commissars, or SOVNARKOM (*Soviet Narodnykh Komissarov*), thus combining in his own hands control of both Party and Government. A week after the Germans struck, the State Defense Committee or GKO (*Gosudarstvenniy Komitet Oborony*), composed of Stalin, Molotov, Voroshilov, Malenkov, and Beria, was

created to take over absolute control of both the government and the armed forces. GKO administered military matters through the *Stavka*, the High Command Headquarters (*Stavka Glavnogo Komandovaniya*). Eventually, on 8 August, Stalin became *de jure* Supreme Commander-in-Chief (*Verkhovnyy Glavnokomanduyushchiy*). Directly subordinate to Stalin and *Stavka* was the General Staff, the source of planning and intelligence upon which the *Stavka* could base its decisions. Since Stalin was also the Commissar of Defense, in addition to all his other offices, the direction of the war was closely controlled by him.

At first the *Stavka* could do little but exhort its Front commanders to hold fast and shoot those it considered incompetent, a fate that befell General Pavlov, the unfortunate commander of the Western Front, Rychagov, aviation commander of the Northwestern Front, and others. The search for competent leaders was desperate, and allotting commands to court favorites came to an end when Budenny on the Southwestern Front and Voroshilov on the Northern Front proved to be disastrous choices. The horribly expensive training of Soviet commanders went on through the summer and fall of 1941, and finally the better endowed leaders began to emerge from this trial by combat by late 1941. Or, as Erickson so neatly expressed it: "The summer and autumn battles brought on a military purge as opposed to a political purge of the military."³¹ What

³¹*The Soviet High Command*, p. 624.

Stalin had perpetrated during the *Yezhovshchina* had to be paid for in blood and suffering in 1941.

The *Stavka* also used the NKVD lavishly, especially its machine-gun squads to prevent unordered retreats. Beria, as a member of GKO, was always available and amenable to enforce Stalin's will in the Red Army. The commissar system, headed by the unpopular Mekhlis, was greatly reinforced, but served more to irritate the military commanders than to boost morale. But even in so severe a crisis as 1941, the fear of political unreliability was ever present and overrode the desire for military competence on occasion.

The Renewal of the German Offensive Against Moscow. The German forces had battled with mud up to the waist throughout the latter half of October and on the 31st were ordered to stand down and await better weather. Colonel Seaton in his excellent account of the battle for Moscow entitles the chapter dealing with the last two weeks in October "The Rasputitsa."³² *Rasputitsa* is a Russian word for the "season of bad roads," and given the dubious quality of Russian roads even in good weather it is easy to imagine the bottomless bogs they become when it rains. Soviet historians, anxious to salvage a little glory for the Red Army amidst the disasters of 1941, tend to jeer at the German accounts of the *rasputitsa* period as rationalization for the first the halt and then the defeat before Moscow. But a myriad of contemporary

³²Albert Seaton, *The Battle for Moscow, 1941-1942*, New York, Stein and Day, 1971, chapter 4.

photographs showing the German tanks, trucks, horses and men stuck in muck and mire would seem to be proof positive that the *rasputitsa* was more effective than Russian skill and valor in halting von Bock's drive on Moscow in October 1941.

The German *Blitzkrieg* technique depended heavily upon fast movement, especially by tank units, synchronized with close air support. The name of the game was *movement*. Came the *rasputitsa* and all movement slowed to a crawl, if that. Even the air support was greatly hampered by poor visibility, sloppy airfields, and bogged down logistic support. There was nothing the *Wehrmacht* and the *Luftwaffe* could do except sit on their tails until cold weather hardened the roads enough to allow the Panzers to get going again.

Finally, on 15 November the Germans renewed their drive on Moscow. The weather had cleared and frost had hardened the ground enough for the tanks to move. Guderian's Second Panzer Army, on Army Group Center's southern wing, moved out against the Soviet Southwest Front below Tula, Reinhardt's Third Panzer Group attacked Konev's Kalinin Front, and Hoepner's Fourth Panzer Group went after Zhukov's West Front which was screening Moscow. Over the next ten days Reinhardt and Hoepner drove their tanks some fifty miles, almost to the outskirts of Moscow. Guderian was having tougher going in the south.

Then came the cold, the snow, and the Siberians, a combination that brought the German offensive to a grinding halt. Throughout

the summer and fall of 1941, Stalin was pulling in toward Moscow well-trained troops and as much equipment as possible from the Far Eastern command, the Trans-Baikal area, Outer Mongolia, and Central Asia. The total came to around 40 rifle and cavalry divisions, 1,700 tanks, and 1,500 aircraft.³³ The neutrality pact with Japan, signed in April 1940, and Dr. Sorge's assurances from Tokyo that the Japanese had other fish to fry toward the south, gave Stalin confidence that he could safely weaken his forces along the Far Eastern borders. The Germans were unaware of the reserves thus being accumulated behind the Russian fronts. Even Field Marshal Kesselring, commander of the *Luftwaffe* Second Air Fleet up to the end of November, says that:

It is still a puzzle to me, even today, that our long-distance reconnaissance, although reporting lively movement on the roads, never to my knowledge gave warning of the strategic concentration of the Russian armies from the Far East.³⁴

While the intense cold was reducing the *Luftwaffe* to a semi-immobile force of frozen planes, the Soviet aviators were faring much better. According to the official account, they flew 51,300 sorties during the two-month battle for Moscow, 86 percent of them in close support missions, and "the enemy lost about 1,400 planes in the Moscow sector."³⁵ Leaving aside the validity of the statistics, the authors do go on to point out, and correctly, that the

³³Erich von Manstein, *Lost Victories* (Translated by A. G. Powell), Chicago, Regenery, 1958, pp. 631-32.

³⁴Kesselring: *A Soldier's Record* (Translated by Lynton Hudson), New York, Morrow, 1954, p. 106.

³⁵*Soviet Air Force in World War II*, p. 79.

increased activity of the VVS was the result of the availability of good airfields with good technical services in the Moscow area plus the fact that cover was provided by the Moscow PVO *strany*. Furthermore, during the defense of Moscow, for the first time, Frontal, Long-Range Bomber, and PVO fighter aviation were unified under the single control of the Commander-in-Chief of the Air Force of the Red Army, thus facilitating an economy of effort and a higher degree of flexibility.³⁶

The Red Army Counterattacks. Stalin had been urging Zhukov to come up with a plan for a counteroffensive even before the renewal of the German offensive in November.³⁷ Finally, on 30 November, Zhukov and the General Staff came up with the plan and it was accepted by Stalin and the *Stavka*, probably in that order. It called for offensives by all three Soviet Fronts in the Moscow area: Konev's Kalinin Front was to strike out at the northern wing of Army Group Center, which included Reinhardt's and Hoepner's Panzer Groups; Timoshenko's Southwestern Front was to attack Guderian's Second Panzer Army; and Zhukov's West Front was to pin down the Germans at Mozhaisk and Maloyaroslavets to prevent any diversion of German forces to the wings. If all went well with the plan, the forces of Konev and Timoshenko would fold in the German wings and then race around the Germans in a close imitation

³⁶ *Ibid.*

³⁷ *The Memoirs of Marshal Zhukov*, New York, Delacorte, 1971, pp. 337-38.

of the German-model envelopment, closing the trap at Smolensk. Konev got off the mark on 5 December and Timoshenko followed suit on the 6th. Over the next ten days the troops on the Kalinin Front pushed the Germans away from their threatening posture to the northwest of Moscow. Zhukov's West Front, supported by its Frontal air force, the Moscow PVO, and Gen. Golovanov's Long-Range Aviation, rolled back the enemy. Incidentally, "Long-Range Aviation" would seem to be a misnomer for an outfit that "bombed and strafed his [German] infantry marching formations, tank and truck columns," to quote Zhukov.³⁸ To the south, Gen Belov's cavalry, ably assisted by the Southwestern Frontal Aviation and some of the *Stavka* Reserve, began to smash up Guderian's tank army, rolling it back some 130 km (about 80 miles). Guderian, seeing the handwriting on the wall, flew off to Rastenburg, Hitler's headquarters in East Prussia, to plead with the Führer to be allowed to withdraw his troops and tanks to a defensible position for the winter. The Führer refused, became indignant, and on 26 December fired Guderian.³⁹

On 25 December, the threat to Moscow had been eliminated, Kalinin retaken, and the German 4th Army had been split from its northern wing, the Third and Fourth Armored Groups, while its southern wing was in deep trouble. Von Bock, ill for some time, was replaced by von Kluge, and, at headquarters, von Brauchitsch was fired, and

³⁸*Ibid.*, p. 350.

³⁹Gen Heinz Guderian, *Panzer Leader* (Translated by Constantine Fitzgibbon), New York, Dutton, 1952, pp. 264-71.

Hitler became commander in chief of the armed forces. The German generals were screaming for authority to pull back and get some flexibility in their defense, but Hitler, fearing a panic-induced rout such as had afflicted the Grand Army of Napoleon in 1812, demanded that they hold fast, come Cossacks, *katyushas*,⁴⁰ or deep freeze. But the German troops were without proper clothing; supplies were down to a trickle; and their machines (trucks, tanks, and aircraft) were incapable of effective operation due to the cold. The Russians had thrown 17 armies into the counter offensive, had around 1,200 aircraft to the *Luftwaffe's* less than 600, and many of the Soviets' 700 tanks were T-34s. Something had to give, and the wonder is that it gave so little.

By the middle of January 1942, the Soviet northern wing had advanced some 200 miles, up to Velikie Luki, north of Smolensk; the southern wing was well beyond Kaluga; but the Germans managed to hold the Rzhev-Gzhatsk-Vyazma area in the center, and the Red army just did not have the capability nor the reserves to close the trap at Smolensk. By the end of January, the Red Army counter offensive in the Moscow area was petering out, and in some places, the Germans were even counter attacking. The onset of the thaw in March reduced Soviet mobility so drastically that the campaign was

⁴⁰"Katyusha" was the nick-name given to the Soviet truck-mounted, multiple rocket launcher, first used at Rudnya, near Smolensk, 15 July 1941. The simultaneous explosion of dozens of the high-fragmentation rockets was hard on the nerves of the German soldier. The Germans called them "Stalin's pipe-organs."

over. Moscow had been saved, but the *Stavka's* bright hopes for the recovery of Bryansk, Vyazma, and Orel and the encirclement and annihilation of the Germans west of Smolensk were dashed.

The Soviet counterattack in December 1941 was the first time the *Wehrmacht* and the *Luftwaffe* had been on the defensive during world War II. The Soviets had gained a degree of air superiority, that is in certain localities, by December 1941, and the new Soviet T-34 tank, then coming into the inventory in some numbers, was the best tank in the world for its weight, and outgunned the German Mark III and Mark IV. Furthermore, the Red Army was beginning to get adequate numbers of new weapons, especially tanks and aircraft.

Industry Moves East (1941-42). When it became obvious to the GKO shortly after the German onslaught began that the enemy would in all probability overrun much of the heavily industrialized region of Russia, it was decided to transfer as many plants from the Ukraine and Russia as possible east of the Volga River. Many of them went to Central Asia, the Urals, and Western Siberia--all regions out of bomber range for the short-legged German *Luftwaffe*. According to the official Soviet account, the Soviets had moved 1,360 large plants and ten million people by the end of December, a total of one and one half million tons of freight and humans.⁴¹

On 19 August 1941 Stalin ordered most of the aircraft industry to move eastward. From 1 January 1942 on the Yak-1 was produced

⁴¹*Ist. Velik. Otech. Voyn., 1941-45, Vol. VI, pp. 45-46.*

mainly in Novosibirsk, although some facilities remained in Moscow. The Il-2 *Shturmovik* plant was moved to the Volga region and began production again before the end of the year, while the MiG-3 factory went to Kuibyshev in the Urals; the plant for the manufacture of the Pe-2 was located in Kazan and Tupolev's Tu-2 was produced in Omsk.⁴²

The evacuation of most of the aircraft industry to the east caused a severe drop in output in the second half of 1941 and the first three months of 1942 (1,039 aircraft in January, 915 in February, and 1,647 in March). After that the production rate accelerated swiftly: over 25,000 for 1942, 35,000 for 1943, 40,000 in 1944, and 20,900 for the first half of 1945. Counting the 15,735 produced in 1941, the total Soviet output during the Great Patriotic War was about 137,000 planes of all types. Half of the total was single-engined Soviet fighters and about 40,000, or nearly one-third of the total, were Il-2 *Shturmoviks*.⁴³

Heavy attrition throughout the war, especially in the 1941-42 period, made the Soviets very cautious about interrupting production lines to introduce new types of planes and engines. Thus only one basically new aircraft went into production during the war, the Tu-2 twin-engine medium bomber which came into service in early 1944. The rest were further developments of aircraft already being produced

⁴²Alexander, *op. cit.*, pp. 1-3.

⁴³*Ibid.*, p. 4; *Ist. Velik. Otech. Voyn.*, 1941-45, Vol. VI, pp. 45-48.

when the war came to the Soviet Union. In engine production the "nothing-new" concept was extremely rigid. By 1942 Klimov had improved his M-105 engine considerably, but the new engine, the M-107, was not put into series production until 1944 because the demand for engines was so great that any interruption to re-tool or delays necessitated by an assembly-line change-over was certain to get a resounding "nyet" from Stalin and his GKO.⁴⁴

Unsuccessful Soviet Counterattacks in Early 1942. Stalin, greedy for victories to offset the ignominious retreats of the Red Army in 1941, pushed his generals into a series of counterattacks: in the south the Red Army was to re-take the Crimea and in the Ukraine to push the Germans out of Kharkov. Leningrad, besieged by the Finns on the north and the Germans on the other three sides, was to be left more or less to fend for itself.

In the south, on 26 December two Soviet divisions were landed at Kerch to seize the peninsula and thus open the way into the Crimea. Other forces soon followed in a well-executed amphibious operation, thus putting von Manstein in a tough spot. Even Feodosia, in the Crimea itself, was taken by the Soviets, but only temporarily. The big Soviet push came at the end of February and during March, but von Manstein's 11th Army held, although he has few good things to say about his Rumanian allies. By this time the Soviets had two armies, the 44th and 51st, on the Kerch front (about 20 divisions and

⁴⁴Alexander, *op. cit.*, p. 4 and 7.

4 armored brigades), but the narrow neck of the peninsula at Parpach made it difficult to use this manpower effectively. Furthermore, von Manstein now had the 8th Air Corps, commanded by General Baron von Richthofen, which made life miserable for the Red Army in Kerch. Von Manstein went on the offensive on May 8th and by the 18th the Soviet forces were totally defeated. The Germans claim they took 170,000 prisoners, a rather inflated-sounding figure.⁴⁵ With his rear now secure, von Manstein concentrated on Sebastopol and, after two months of terrific fighting, he took this strongly fortified point, the last Soviet stronghold in the Crimea.

The German line from Kharkov, opposite the northern flank of the Russian Southwestern Front, to the Sea of Azov, a distance of over 300 miles, was held by 37 German divisions and a few allied divisions, mainly Rumanian and Italian. Its air arm, the *Luftwaffe* Second Air Fleet, had only 300 aircraft, mostly bombers at that. Facing the Germans was Timoshenko's Southwest Theater, composed of the Bryansk, Southwest and South Fronts. In January and February, Timoshenko's forces counterattacked the Germans with limited success, carving out a deep salient in the German front at Lozovaya, the so-called "Lozovaya pocket."⁴⁶

Although the Soviet winter offensives, from December 1941 through March 1942 were fairly successful at Moscow, somewhat less so in the

⁴⁵Von Manstein, *Lost Victories*, p. 238.

⁴⁶Seaton, *The Russo-German War 1941-1945*, pp. 248-50.

Ukraine, and not at all on the northern and southern extremes, Leningrad and the Crimea, they did check the German momentum and for several months the German soldiers had to devote their major efforts to holding operations, to hasty retreats, and to just trying to stay alive in the hostile winter environment of Russia.

Just about the time von Manstein was routing the Red Army on the Kerch Peninsula, the *Stavka* ordered Timoshenko to liberate Kharkov, the fourth largest city in the USSR, and thus upset the German schedule for their 1942 campaign. It so happened that while von Bock, now commanding in the Ukraine, was laying plans to eliminate the so-called "Lozovaya pocket," Timoshenko, planning an attack on Kharkov from the same "pocket," moved the bulk of his tanks, some 600 KV's and T-34's, into that same area. Timoshenko struck first, on May 12th, and drove deep into the German rear, but was soon being hit on both flanks, by Paulus' forces (14 divisions and two Panzer Corps) from the north, and von Kleist's Panzers from the south. By the 18th Timoshenko was asking *Stavka's* permission to withdraw, but Stalin had made this a prestige affair and ordered a continuation of the attack. On the 23rd Paulus' tanks met those of von Kleist at Balakleya and the trap was closed. It cost the Russians most of their tanks on the Southwestern and Southern Fronts--less than 200 remaining for both Fronts.

The authors of the official Soviet history of the air war reach new heights in the art of the laconic statement in their description of the Soviet disaster at Kharkov. They handle it in a single paragraph:

In May the relative calm on the front was replaced by bitter fighting. The most difficult situation for the Soviet troops developed in the Crimea and in the region of Kharkov. The misfortunes of our troops near Kharkov compelled the Red Army to refrain from offensive plans and once more, just as in summer 1941, to resort to a strategic defense along the entire Soviet-German front. Again the initiative in the war's conduct passed to the enemy.⁴⁷

13. GERMAN OFFENSIVES IN 1942 AND THE REVERSAL AT STALINGRAD

Hitler, again in a state of euphoria as a result of the Soviet goof at Kharkov, decided to multiply his objectives in the 1942 summer campaign, and, as usual in his Russian adventures, he tried to do too much with too little. With the exception of the usual scheme to tighten the noose around Leningrad by creating a junction with the Finns, the main emphasis in 1942 was to be put on drives through the Don Bend, along the Volga, and through the Kuban to the Caucasus oil fields at Grozny and Baku. Von Bock's Army Group South was sub-divided into Army Group A, under von List, made up of the 17th Army, lots of satellite formations, and von Kleist's Panzer Army. Army Group B, under von Weichs, was composed of the 2nd Army, Hoth's Fourth Panzer Group, and Paulus' very strong 6th Army. Army Group B was to take Voronezh, on the upper Don, then clear out the whole Don Bend area, hit Stalingrad, and proceed along the Volga. Army Group A was to go through Rostov, then fan out toward several objectives in the Caucasus foothills and the Kuban, but always keeping its eye on the eventual target--Baku oil. The German offensive began on June 28th and within a month

⁴⁷*Soviet Air Force in World War II.* p. 93.

German armies had penetrated well into the Don Bend, had overrun Rostov, and were spreading out over the Kuban and the Caucasus foothills.

The Battle of Stalingrad. By mid-July the Germans had pushed the Russians back to the Don River and were readying themselves for a drive on Stalingrad. German control of Stalingrad would enable the Germans to cut off Baku oil to the rest of the country and also cut off the Lend-Lease supplies being shipped via Iran and the Caspian Sea to the Volga. At the end of July *Stavka* created a new Front, the Stalingrad Front, which had, according to Marshal Zhukov, 187,000 men, 360 tanks, and 337 planes with which to face the Army Group B's 250,000 men, 740 tanks, and 1,200 aircraft (of the 4th Air Fleet).⁴⁸ But Seaton claims that the splitting of Army Group South into Army Groups A and B meant that the 4th Air Fleet had to support two army groups with its 4th and 8th Air Corps. In June 1942 the two corps together had 1,600 planes, but by 20 October only 974, with only 594 of those still airworthy.⁴⁹

On 23 August the German tanks reached the Volga just north of Stalingrad. The *Luftwaffe* then proceeded to reduce the city to rubble and from mid-September to mid-November the men of the Red Army and the *Wehrmacht* fought tooth and toe-nail in the wreckage

⁴⁸*Marshal Zhukov's Greatest Battles* (Translated by Theodore Shabad), New York, Harper & Row, 1969, p. 127.

⁴⁹*The Russo-German War*, p. 311.

of the city, a city strung out along the right bank of the Volga for thirty miles. The main brunt of the cellar-to-cellar fighting fell on Gen. Chuikov's 62nd Army. The Germans referred to this war in the rubble as the *Rattenkrieg* (war of the rats).⁵⁰

Zhukov, by then Deputy Supreme Commander, the first and last to get that near to Stalin in rank, was given the task, along with Vasilevsky, the Chief of the General Staff, of coming up with a plan for a counteroffensive. The plan, presented to Stalin in mid-September, envisaged a two-month build-up of the Fronts adjacent to Stalingrad and then the launching of a gigantic pincer movement by Vatutin's Southwest Front from the north and Yeremenko's Stalingrad Front from the south. The two forces were to meet at Kalach, the only feasible Don River crossing by which Paulus could get his 6th Army out of the trap. Zhukov saw time as on the Soviet side because the 6th Army of Paulus and the 4th Tank Army of Hoth were burning themselves out in Stalingrad while the Red Army was beginning to get a steady flow of T-34 tanks and new types of aircraft. Of course, success depended upon the ability of Chuikov's *Ratten* to hold out in the cellars of Stalingrad until the counter-attack was readied--and they did.

Finally, on 19 November, the counterattack began with a Soviet

⁵⁰The best account of the fierce struggle within the city is in Marshal V. I. Chuikov, *Nachalo puti (The Beginning of the Road)*. Moscow, 1959. English translation by Harold Silver entitled *The Battle for Stalingrad*. New York, Holt, Rinehart, and Winston, 1964. Marshal A. I. Yeremenkov, Chuikov's superior as commander of the Stalingrad Front, describes the battle as seen from headquarters in his book, *Stalingrad*. Moscow, 1961.

breakthrough in the north, a smashing of the Rumanian 3rd Army. On the following day the Soviet push began in the south. By 23 November the trap had been closed. The Southwest Front's 4th Tank Corps linked up with the Stalingrad Front's 4th Mechanized Corps at Sovetsky, near Kalach. Paulus's 6th Army, some 250,000 men, was in the "cauldron" or as the German has it, the "Kessel." Soon there were a million Red Army troops along the perimeter of the "Kessel," an area about the size of Connecticut.

By the time of the counteroffensive in November 1942, the Soviets had attained a superiority in aircraft numbers and even some superiority in the air. In addition to the 8th and 16th Air Armies, the Stalingrad defenders were backed by the 102nd Fighter Division of PVO, five divisions of ADD (long-range bombers), and the 287th Fighter Division recently retrained in the new La-5 fighters.⁵¹ The VVS gained flexibility when there was created a *Stavka* Reserve of two to four air divisions which could be dispatched to buck up a failing Front or plug a leak in the defense lines. Furthermore, in 1942 fighter regiments had their strengths increased from 22 to 32 planes. At this time the "basic battle unit became the flight, consisting of two pairs of aircraft."

⁵¹The La-5 was an adaptation of the Lagg-3. Tested in April 1942, and in production by July, it was available for use in the Stalingrad affair by September. It had a new 1,510 hp ASh-82A 14-cylinder, air-cooled radial engine, which simplified maintenance. The aircraft had a top speed of 375 mph and carried two synchronized 20mm cannon. Alexander, *op. cit.*, pp. 168-70.

VVS's main task in the defense of Stalingrad was close air support, reconnaissance, and very short-range bombing. As the authors of the official history put it:

Ground-attack-planes and fighters operating with infantry and artillery attacked the enemy right on the front line, and aircraft of the front and long-range bombers struck against reserves, artillery and troops located 2 to 5 kilometers from the front line.⁵²

The Commander-in-Chief of the VVS, Gen. A. A. Novikov, stayed right on the scene at Stalingrad to see to it that his boys did their job right, as did also the ADD Commander, Gen. A. Ye. Golovanov. For a matter of fact, the battle of Stalingrad became the launching pad for many top military leaders of the future: Rokossovsky, Chuikov, Yeremenko, Moskalenko, Malinovsky, and the main political officer was Khrushchev.

Once the trap was closed at Sovetsky on 23 November, logic would seem to call for Paulus to fight his way out of the trap while he still had some vigor left in his troops. But Hitler by that time was running the war in the East almost at a tactical level and he now faced, or should have faced, two serious problems: what to do to get Paulus out of the hole and how to prevent the Red Army from trapping Army Group A in the Caucasus and Kuban. But the Fuehrer had lost his grasp of reality and he began to clutch at straws. Goering promised him that the *Luftwaffe* could supply the 6th Army, a manifest absurdity given the German shortage of

⁵²*Soviet Air Force in World War II*, pp. 103-4.

transport aircraft and the lousy weather in the Don area in November and December. But Hitler believed him, probably because he wanted to, and decided to keep the 6th Army in place before Stalingrad rolled up in a "hedgehog" to await the 1943 offensive for deliverance.

When Colonel-General von Richthofen, commander of the 4th Air Fleet, heard of Goering's promise to supply Paulus' 6th Army by air, he shouted at the Chief of Staff of the *Luftwaffe*, Jeschonnek: "You've got to stop it! In the filthy weather we have here there's not a hope of supplying an Army of 250,000 men from the air. It's stark staring madness!"⁵³ And it is no wonder that von Richthofen was appalled. To keep the 6th Army functioning would require the delivery of 600 tons a day in food, ammunition, and fuel. The 4th Air Fleet, moreover, had already been partially immobilized since early November because of filthy weather and freezing temperatures. The supplies would have to be flown in from the only two air bases near enough to be useful--Morosovskaya and Tazinskaya, or "Moro" and "Tazi" to the men engaged in the air lift. By the beginning of September, eleven *Gruppen* (wings) of Ju 52s and two of Ju-86s, about 320 aircraft in all, were ready at "Tazi."⁵⁴ The Junkers Ju 52 had long been the transport workhorse of the *Luftwaffe*, the

⁵³Cajus Bekker, *The Luftwaffe War Diaries* (Translated by Frank Ziegler), London, Macdonald, 1964, p. 278.

⁵⁴*Ibid.*, p. 283.

lumbering "good old aunt." It was a three-engine monoplane with a cruising speed of just under 150 mph and a range of 250 miles if fully loaded with two and a half tons or up to 850 miles if freight were traded off for fuel. The Ju 86, initially a commercial transport, had been re-fitted for military use; it carried an even smaller load than did the Ju 52. Since it was 140 miles from "Tazi" to the Pitomnik airfield in the "Kessel," neither the Ju 52 nor the Ju 86 could afford to trade off much fuel for freight.

At Morosovskaya, or "Moro," about half the available Heinkel He 111 bombers, some 190 aircraft, were assigned to the air lift. The He 111 was a twin-engine bomber with a cruising speed of 225 mph and could haul a two-ton load 760 miles. The other half of the available He 111s was reserved for the protection of "Tazi" and "Moro" from seizure by the Red Army.

By 30 November the Junkers transports and the He 111s were making joint flights day and night to Pitomnik, sometimes with fighter escorts. As soon as the planes landed on the snowy field they were directed off the runway and immediately unloaded including the fuel not needed for the return trip.⁵⁵ Right from the start, however, the operation was the victim of the weather. For days the transports would have to stand-down and even on good days it took hours to thaw out the engines enough to start them. Inspections, repairs, and engine changes had to be made in the open by

⁵⁵ *Ibid.*, pp. 283-4.

mechanics with frozen fingers. As Bekker puts it: "Inevitably the availability state fell to a mere twenty-five per cent."⁵⁶ Instead of 600 tons a day, the airlift hit an all-time high when it hauled 700 tons between 19 and 21 December--that is, 700 tons for all three days together. Then came the fog on the 22nd!

To make matters worse, the Russians took Tazinskaya on 24 December and Morosovetskaya in early January. Some 60 Junkers transports were lost at "Tazi" in addition to spare parts and ground equipment. Now the transports had to operate from bases sixty miles farther away, almost 200 miles from Pitomnik. By this time the Soviets were getting lots of new fighters and they were making life miserable for the lumbering German transports, forcing them to fly in formations of 40 or 50 with fighter escort. This presented a real problem in the unloading process at Pitomnik with its limited facilities.

In early January 1943, eighteen Focke-Wulf Fw 200 "Condors" were supplied for the airlift. These four-engine transports could carry up to 20 tons and had a range of over 1,200 miles, made to order, it would seem, for the airlift. But on the first trip the "Condors" made to Pitomnik, five of the seven ended up out of action for various and sundry reasons. The other dozen or so did valiant work up to the end. Then the new four-engine He 177 bomber was tried and turned out to be a flop. In short, the *Luftwaffe* just did not have anywhere near enough transports and even those it did have were too light and short-legged for the task.

⁵⁶ *Ibid.*, p. 284.

The Red Army overran Pitomnik on 16 January and the auxiliary airfield at Gumrak was seized by the Russians on 21 January. The remnants of Paulus' 6th Army were taken prisoner by the end of January. Between 24 November 1942 and 31 January 1943, in the space of a little over two months, the airlift had cost the *Luftwaffe* 266 Ju 52s, 165 He 111s, 42 Ju 86s, 9 Fw 200s, 7 He 177s, and one Ju 290--a total of 490 planes.⁵⁷ Even worse, the image of the *Luftwaffe* as an irresistible force was shattered irreparably.

Of course, Bekker was reporting only transport losses. The Soviet claims are much higher. They have the *Luftwaffe* in the defense of Stalingrad up to 23 November 1942 losing 2,100 planes,⁵⁸ and between 19 November 1942 and 2 February 1943 losing 3,000 more.⁵⁹ Between 22 June 1941 and 30 June 1942, the German losses in aircraft came to 15,700, if one believes the Russians.⁶⁰ Needless to say, German figures are quite different, some 2,951 planes lost and 1,997 damaged between 22 June 1941 and 8 April 1942.⁶¹

In spite of the enormous disparities in claims, there can be little doubt that by February 1943 the VVS was the mightier of the two air forces. The number of air armies had been increased, *Stavka*

⁵⁷*Ibid.*, p. 294.

⁵⁸*Soviet Air Force in World War II*, p. 110.

⁵⁹*Ibid.*, p. 146.

⁶⁰*Ibid.*, p. 114.

⁶¹Bekker, *op. cit.*, Appendix 14, p. 377.

had ten air corps in its reserve, and the air effort was now synchronized--Gen. Novikov, head of VVS, as a representative of *Stavka*, coordinated the activities of Frontal Aviation, ADD, and the fighter element of PVO. During 1941-42 the Soviet aircraft industry delivered 33,857 planes to the VVS while the German aircraft industry, including plants in the satellites, came up with only 20,857.⁶²

Stalingrad was not only the turning in the Great Patriotic War as a whole, but was also a definite watershed in the relationship between the *Luftwaffe* and the VVS. The whole German military machine in the East was on the defensive after the catastrophe on the Don and Volga. German counterattacks were made later in war, but they were feeble things compared to the blitzkrieg-type encirclements of the 1941 and 1942 varieties. They were futile attempts to get the initiative again--Hitler was dreaming the impossible dream.

14. THE TIDE TURNS: SOVIET OFFENSIVES IN 1943

While Zhukov was urging on his fronts to annihilate the 6th Army in the Stalingrad "Kessel," Golikov's Voronezh Front recaptured Voronezh and wiped out the Hungarian 2d Army, some 200,000 men. By 16 February, Golikov's army group had re-taken Kharkov and seemed headed for the Dnieper. Von Manstein managed to hold the Mius River line long enough to let Army Group A escape through Rostov,

⁶² *Soviet Air Force in World War II*, pp. 114-117.

and then he had to pull back through the Donets Basin, fighting a flexible rear-guard action. Vatutin's Southwestern Front took Voroshilovgrad, and Malinovsky's Southern Front finally seized Rostov, slamming the stable door after the horses were out. By 20 February, the Russian advance units were within 40 miles of the Dnieper at Dnepropetrovsk but ahead of their logistic support. This was a new experience for the Red Army leaders as they had spent 1941 and 1942 always retreating toward their dumps and railheads, and they were a little inept at keeping things flowing in the other direction. Furthermore, the Red Army units in their headlong pursuit of the Germans had become dispersed from each other as well as exhausted--in short, they were in ideal shape to tempt a German counteroffensive.

Hitler, for once, was somewhat chastened after the catastrophe of Stalingrad; his faith in his "intuition" a bit shaken. His stand-fast-and-don't-yeild-an-inch policy during the winter fiasco before Moscow had paid off in averting panic and rout, but the same instructions to Paulus had lost him an army. Thus, in February and March 1943, he let von Manstein have a relatively free hand in the defense of the Ukraine. He also swallowed his pride and asked Guderian, whom he had fired at the end of December 1941, to return to service as inspector general of all armor in order to straighten out the German tank situation now in a mess from factory to combat unit. Guderian was to be responsible only to the Fuehrer himself, which alienated the other commanders and the staff and handicapped

Guderian considerably.

In the last two weeks of February and the first week in March, the Russians were thrown back to a line along the Donets River and south from Voroshilovgrad to Taganrog on the Black Sea. Kharkov was again in German hands. The *Stavka* was stunned by the sudden reversal and became fully aware that the supposedly beaten Germans still had lots of kick left in them; they had turned with lightning-like speed and had chopped up the Russian advance units in a style analogous to the *Blitzkrieg* days of 1941-1942. Von Manstein's masterly use of Hoth's Fourth Panzer Army and Hausser's SS Panzer Corps in pincer movements demonstrated beyond peradventure of a doubt that the Nazi war-machine was not to be held in contempt yet. In retrospect, however, it was the last demonstration of the German free-wheeling use of armored forces in deep-penetration and encircling tactics, for the great tank battle of Kursk in the summer of 1943 destroyed the Wehrmacht's initiative and most of its tanks.

The Battle of Kursk or "Zitadelle," The Kursk salient, a protrusion in the Soviet front north of Kharkov and south of Orel, was a tempting target for the German offensive in the summer of 1943. Its very obviousness made it equally clear to the Russians that this would be the target, and, during May and June, the Kursk bulge was filled with guns and tanks. Zhukov and Vasilevsky, the Chief of the General Staff, were sent down by *Stavka* to coordinate the effort. Some 20,000 pieces of artillery, including 6,000

antitank guns, were poured into the salient, as well as over 900 *Katynsha* trucks. A strong tank force, the 1st Armored Army, was stationed in the bulge itself, and the 5th Tank Army was held just outside the area as a mobile reserve. Two-thirds of the *Luftwaffe's* aircraft on the Russian front were allocated to the Kursk offensive, some 2,000 planes (1,200 bombers, 600 fighters, 100 dive-bombers, and 150 reconnaissance machines). The VVS had nearly 3,000 planes, thus giving it a 1.5 to 1 advantage over the Germans.⁶³

Most of the German commanders, with the outstanding exception of Guderian, since they had been reinforced with new *Tiger* and *Panther* tanks good enough to face the T-34s and with new mobile guns, the 100-mm *Jagdpanzers*, were confident that they could again pull off a great encirclement and again take the offensive in the Ukraine and Central Russia. Disputes, waits for the new tanks and guns, and other troubles, however, held up the German offensive until 4 July. This was the background of operation "Zitadelle," or the Battle of Kursk.

During the lull through May and June, the main activity was in the air. In early May Soviet aircraft attacked German airfields in an effort to destroy the *Luftwaffe* planes on the ground, a strategy so well taught them by the Germans in 1941. While they were assaulting German airfields, the German bombers were running almost nightly missions against the Soviet military-industrial plants

⁶³ *Soviet Air Force in World War II*, pp. 164-65.

at Gorki, Saratov, and Yaroslavl. In early June the VVS bombers concentrated on the bases from which the German bombers were taking off on their industry-busting missions. Just how effective the operations of either side was in the months of May and June is debatable, i.e. depends upon whose figures you believe.

During the afternoon of 4 July, von Manstein sent in the first of the 2,000 German tanks which participated in the battle to hit the Kursk salient about opposite Belogorod on the upper Donets, apparently quite unaware of the tremendous amount of Soviet artillery and some 3,600 tanks which the Russians had available. Model simultaneously assaulted the Kursk salient from the northern base of the bulge. But Russian artillery, dug-in tanks, and well-mined areas along the advance routes slowed the intended *Blitzkrieg* to a crawl. By 12 July, Model was stopped, and the Russians sent the 5th Tank Army to Vatutin to help smash Hoth's attack--two days later, it was all over in the Kursk salient. The biggest tank battle in history had gone to the Russians, and they were already embarking on a counteroffensive by 15 July. The war was to last almost two more years, but the initiative had passed to the Red Army, and the Germans were from then on fighting a defensive war.

The *Luftwaffe*, assigned von Richthofen's 1st, 4th, and 8th Air Corps, about 2,000 machines, to operation Zitadelle. The Soviets in turn had the 2nd, 5th, and 16th Air Armies, plus two PVO fighter divisions, about 3,000 aircraft, assigned to the Kursk area, which was held by the Vorenezh and Central Fronts. In addition, these

fronts could call upon the aircraft of four adjacent fronts for assistance if needed and also upon the *Stavka* reserves. Thus the VVS was in the driver's seat when it came to numbers. The intensity of the war in the air was almost unbelievable. At one stage in the battle, the German offensive in the Belogorod area against the Voronezh Front, over 2,000 aircraft were operating in an area of 12 by 37 miles and air battles often involved 100 to 150 planes.⁶⁴ Soviet numerical superiority prevailed. As one German writer puts it:

The German efforts to regain air superiority during the summer 1943 offensive had no continued or full successes. After the last German attacks in the Kursk salient had failed in the autumn of 1943, the Russians definitely ruled the air.⁶⁵

The Russian counteroffensive drove the Germans back to the Dnieper, the right bank at that. Von Manstein, by the late fall of 1943, had a 450-mile front to protect with only 37 infantry divisions and 17 Panzer divisions, some of which were down to regimental strength. Hitler was back to his old policy of yield not an inch, insisting that the bridgeheads at Zaporozhe, Dnepropetrovsk, Kremenchug, and Kiev all be held. The chief asset of the German command, flexibility in strategy and tactics, was thus lost.

15. SOVIET SWEEP TO BERLIN (1944-45)

During the last half of 1943, the German Army in the East was deteriorating rapidly at the same time that the Soviet forces were building up rapidly to a crescendo--they now out-manned and out-gunned

⁶⁴*Ibid.*, p. 174.

⁶⁵Walter Schwabedissen, *The Russian Air Force in the Eyes of German Commanders*, p. 168.

the Germans by large ratios, had a superiority in tanks, and had gained control of the air.⁶⁶ For example, in the three months immediately after the defeat at Kursk, von Manstein's forces received only 33,000 men to replace the 133,000 casualties in the Ukraine.⁶⁷ While the various segments of the Wehrmacht were struggling to get a share of the relatively sparse output of new *Panther* tanks, the Russians were pouring out almost 2,000 T-34 chassis a month--half being used for tanks and the other half for SU self-propelled guns. Aid from the West, especially trucks and half-tracks, put the Red Army on wheels and tracks, thus increasing its mobility enormously.

To make matters worse, if that were possible, Hitler was now insisting on the retention of every square meter of territory in the East and refusing to allow even regiments to be moved without his acquiescence. He refused to believe realistic estimates of Soviet strength and counted his own divisions as though they were up to their original size. He apparently thought that if he could hold out in the East and fend off attack from the West, the coalition would split, allowing him to get favorable terms from one side or the other. His better commanders, such as Guderian, von Rundstedt,

⁶⁶According to the Soviets, *Ist. Velik. Otech. Voyn. 1941-45*, Vol. V, p. 467, the Red Army only increased 11 percent in manpower during 1943, but increased 80 percent in guns, 33 percent in tanks, and 100 percent in aircraft.

⁶⁷Alan Clark, *Barbarossa: The Russo-German Conflict 1941-45*, New York, Morrow, 1965, p. 370.

and von Manstein, advocated withdrawals to fortified lines well to the rear of the front lines, but their pleas only triggered off hysterical accusations of incompetency from the Fuehrer.

By March 1944 the Red Army had pushed its front line in the Ukraine to the Bug River, with a salient along the Black Sea that encompassed Odessa. As a result, Hitler fired von Manstein, Hoth, and von Kleist, three of his best generals, thus easing the Soviet task of pushing the *Wehrmacht* out of Russia. In the north, the Baltic and the three Byelorussian Fronts went on the offensive on 22 June in commemoration of the Nazi attack on 22 June 1941. The four Fronts had a combined total of 6,000 aircraft.⁶⁸ Vasilevsky commanded two Fronts and Zhukov the other two. By July Minsk had fallen and the Soviets had torn a 250-mile hole in the German lines, thus opening the path to Poland and Lithuania.

In the south, the Ukrainian Fronts, four of them, tore into Rumania, helped by the Rumanian Army's turning on its German ally. By the fall of 1944 the various Ukrainian Fronts had fanned out over the Balkans: Rumania, Bulgaria, northern Yugoslavia, and by November two of them were approaching Budapest. The city was encircled by the end of December.

The VVS was not only getting more planes, but also getting better ones. The Yak-9 made its first appearance over Stalingrad in the winter of 1942-43. Primarily an interceptor, it was also

⁶⁸*Ist. Velik. Otech. Voyn. 1941-45, Vol. IV, p. 16.*

used as a ground attack plane and a fighter-bomber. In mid-1943 Yakovlev increased its fuel capacity and the Yak-9D (*dal'niy*, long-range) had a range of 870 miles. Its range was extended even further in 1944 as the Yak-9DD (*dal'nyy deystviya*, long-range operations) could get from the Ukraine to Italy, a distance of 1,120 miles. This plane was used as an escort for the B-24 and B-17 bombers in their shuttle-bombing runs. It had a top speed of about 380 mph.⁶⁹ The Petlyakov Pe-2 underwent improvements throughout the war. When the new German Me 109G appeared on the Russian front in early 1943, the Pe-2 was souped up with an M-105PF engine which could develop over 1,200 hp.⁷⁰

By 1944 the German bombers had to confine their activities to night operations since they had practically no fighter cover for daytime activities. The Yak-3 (replacing the Yak-1 on the production lines in the summer of 1943) poured into the VVS inventory in 1944. A 400-mph fighter, it was a match for the Me 109G and the Focke-Wulf Fw 190. The Lavochkin La-7, which went into series production in the summer of 1944, had a top speed of 420 mph and was especially designed to cope with the Fw 190.⁷¹ Even the German advantage of skilled and combat-hardened pilots had been dissipated by 1944. The

⁶⁹Alexander, *op. cit.*, pp. 426-29.

⁷⁰*Ibid.*, pp. 299-300.

⁷¹*Ibid.*, pp. 430-33 and 172-73.

murderous losses suffered by the *Luftwaffe* necessitated the use of newly fledged fliers. The VVS, however, was fairly wallowing in trained pilots by 1944. An even more important factor helped the Soviets gain control of the air in 1944 and that was the diversion of the best German interceptors to Western Europe to try to cope with the growing intensity of the Anglo-American air raids on the Reich and the invasions of Fortress Europe. Obviously, the *Luftwaffe's* resources were stretched too thin to be effective on any of the many fronts that had developed by 1944. Attempts to regain the initiative on the Eastern front, either on the ground or in the air, were bound to fail.

Finally, in the attack on Berlin in April 1945, the VVS was able to concentrate 7,500 of its 15,540 aircraft against the pitiful remnants of the once proud *Luftwaffe*. The Soviet claim of 1,132 German planes shot down in the battle for Berlin may be dubious, but there can be no doubt about who controlled the air over that city.⁷² Anyway, the main task of the VVS in the battle of Berlin was close-support and its airmen did an excellent job.

16. THE WAR IN THE FAR EAST (AUGUST 1945)

The Soviet leaders must have had some bad moments during the summer months of 1941 and again in the late summer of 1942 when a Japanese attack in the Far East could have been catastrophic. Thanks to Sorge's information from Tokyo in 1941-42, however, they were

⁷²*Soviet Air Force in World War II*, p. 361.

relatively sure that the Japanese would abide by the Neutrality Pact of April 13, 1941, and after 7 December 1941 the Japanese had their hands full in the Pacific. Under these conditions, the Russians were able to reduce their Far Eastern forces enough to provide some much-needed Siberian divisions on the German front, a transfusion badly needed by late 1941 and again in the fall of 1942.

Even in 1943 and 1944, the Soviets at Teheran⁷³ and other conferences, although agreeing with the desirability of the destruction of the Japanese war machine, were disinclined to discuss Soviet participation in the Far Eastern conflict. As long as Germany was undefeated, they wanted no part of a two-front war. It was not until the Yalta Conference in February 1945 that they made any firm commitment apropos an attack on the Japanese forces in Manchuria and Northern China. As a reward, the Soviets were to get the southern half of Sakhalin Island, lost at the Treaty of Portsmouth in 1905, the Kurile Islands, in Japanese hands since 1875, recognition of the *status quo* in Outer Mongolia, the port of Dairen to be internationalized, with Soviet interests recognized as pre-eminent, plus the lease of Port Arthur as a Soviet naval base, and joint Soviet-Chinese control over the Chinese-Eastern and South-Manchurian railroads. The Soviets, in turn, agreed "that in two or three months after Germany has

⁷³ At Teheran, Stalin explained that the Russian forces in the Far East would have to be tripled before an offensive would be possible. This could only be done after the defeat of Germany. Max Beloff, *Soviet Policy in the Far East, 1944-1951*. London, Oxford University Press, 1953, p. 21.

surrendered and the war in Europe has terminated the Soviet Union shall enter the war against Japan. . . ."⁷⁴

Molotov, on 5 April 1945, informed the Japanese that the Soviet Union was denouncing the 1941 Neutrality Pact one year in advance; it was due to expire on 13 April 1946. Legally, the Soviets could not attack the Japanese for another year. The Japanese, however, soon noted a build-up of the Soviet forces in the Far East. Actually, the build-up began right after the Yalta Conference in February. According to Japanese intelligence estimates, by June a daily average of 10 troop trains and 5 munition trains arrived from the west of Russia. Between April and the end of July they estimated the following increases in Soviet strength in the Far East: 850,000 to 1,600,000 troops, 3,500 to 6,500 aircraft, and 1,300 to 4,500 tanks.⁷⁵ These figures are not too far from those given in the Soviet request to the United States for supplies needed for the Far Eastern operations: namely, supplies for 1,500,000 men, 3,000 tanks, and 5,000 aircraft.⁷⁶ The Soviet figures for their forces in the Far East on 9 August 1945

⁷⁴Text of the "Agreement Concerning the Entry of the Soviet Union into the War Against Japan, signed at Yalta February 11, 1945" in Beloff, *op. cit.*, p. 25.

⁷⁵*Japanese Special Studies on Manchuria*, Vol. XIII, "Study of Strategical and Tactical Peculiarities of Far Eastern Russia and the Soviet Far East Forces," Office of the Chief of Military History, Department of the Army, 1955, pp. 111-112.

⁷⁶John R. Deane, *The Strange Alliance*, New York, Viking, 1947, p. 248.

were 1,577,725 men, 26,137 artillery pieces, 3,704 tanks, 1,852 self-propelled guns, and 5,368 aircraft, 4,807 of which were combat planes.⁷⁷ These Forces were facing a total Japanese opposition in Manchuria, Inner Mongolia, Korea, and the Kurile Islands of about a million men, 1,215 tanks, 1,800 aircraft, and 6,700 guns and mortars.⁷⁸ The Japanese and their Mongolian and Manchukuoan allies were the residue left behind when the Japanese high command finished pulling out the best cadres to send to other fronts.

In anticipation of the Far Eastern operations, the Soviet command system in that area was changed as follows: A Far Eastern General Army was created, with Marshal A. M. Vasilevsky in command, and subordinate to him were the Trans-Baikal and the 1st and 2nd Far Eastern Fronts. The organization of the forces in this manner gave Vasilevsky a good deal of autonomy in conducting the war against the Japanese, an autonomy made necessary by the enormous distance between Khabarovsk, Vasilevsky's headquarters, and Moscow. The 1st Far Eastern Front was commanded by Marshal K. A. Meretskov, the 2nd Far Eastern Front by Army General M. A. Purkayev, while Marshal R. Ya. Malinovsky headed the Trans-Baikal Front. The Fronts were deployed as follows: Meretskov's from Vladivostok to Bikin, some 1,300 kilometers; Purkayev's from Vikin to almost the Ussuri and Amur to where the latter turns south toward Outer Mongolia, some 700 kilometers;

⁷⁷Raymond Garthoff, "Soviet Intervention in Manchuria, 1945-1946," *Orbis*, Vol. X, No. 2 (Summer 1966), p. 527.

⁷⁸*Ibid.*, *Ist. Velik. Otech. Voyn. 1941-45*, Vol. V, p. 548.

and Malinovsky's along a short stretch of the Amur and all of the southeastern border of Outer Mongolia, over 2,300 kilometers.

The plan of attack was worked out in great detail--after all, the Soviets had plenty of time to get ready for the Far Eastern operations. The Soviet planners, having ascertained that the Japanese defense along the Outer Mongolian border, largely left to Manchukuo and Inner Mongolian forces, was the weakest, decided to let Malinovsky's Trans-Baikal Front carry out the heaviest attack. The 6th Tank Army and the 17th Combined-Forces Army were to get through the Greater Khingan Mountains as fast as possible and then head for Changchun and Mukden. To the south, a Soviet-Mongolian motorized force was to push into Northern China in the direction of Kalgan, while on the left flank in the north an offensive was aimed against Hailar and Tsitsihar.

Meretskoy's 1st Far Eastern Front was to plunge into Manchuria from the east and direct its main thrust through Mutanchiang toward Kirin in order to link up with Malinovsky's 6th Tank Army in a gigantic encirclement of the Kwantung Army. The hammer on this anvil was Pukayev's 2nd Far Eastern Front which was to push down from the north in the direction of Harbin, with flank attacks on Tsitsihar and P'oli.

The offensive began on 9 August and all three Fronts got off the mark on time. Malinovsky's Transbaikal Front, made up of six field armies and including a Tank Army, had almost half of the Soviet forces in the Far East and it was to deliver the main blow. Malinovsky had

to cross large stretches of the Gobi Desert and made his way through the Great Hsingan Mountains. But the Japanese opposition was so weak in that direction that Malinovsky's greatest problem was keeping his machines supplied with fuel. By the sixth day (15 August), Malinovsky's tanks had penetrated some 250 miles into Manchuria. Meretskov's 1st Far Eastern Front, making its way against the strongest Japanese opposition, found it slow going. But Purkayev met only weak opposition and was soon on his way to Harbin. By 19 August the Japanese Kwantung Army had arranged surrender terms with Valilevsky.

Air operations played a minor role in the August campaign in the Far East. The VVS flew only 14,030 combat sorties and 7,427 noncombat missions, partly because the weather was so awful between 11 and 20 August. About a fourth of the sorties were reconnaissance, but the most important contribution of the air force to the campaign was the hauling of supplies and men. The transports carried 2,777 tons of POL, 16,497 men, and 2,000 tons of munitions and other materiel.⁷⁹

The Japanese planes were obsolete, the best having been siphoned off to oppose the American drive across the Pacific. The Japanese fighters, Type 97 and Type 1 (Nakajima fighters "Nate" and "Oscar") were 60 to 100 mph slower than the Soviet La-9s and La-7s, while the Mitsubishi bombers were 100 mph slower than the Pe-2s and

⁷⁹Garthoff, *loc. cit.*, p. 531.

Tu-2s.⁸⁰ Finally, the Soviets were fighting a disheartened Japanese army--the atomic bombs hit Hiroshima on 6 August and Nagasaki on the 9th. On 10 August the Emperor told the Imperial Council that the war must end. All in all, not the milieu in which troops give their all in a do-or-die effort.

Despite the fact that the Red Army was attacking a badly demoralized Kwantung Army, the speed of the armored and motorized forces, the closely synchronized air support, and the business-like way in which the whole operation was carried out, all testify to lessons well-learned on the German front during four years of hard campaigning. The comparison between the smoothly running military machine that plunged into Manchuria, Northern China, and Korea on 9 August 1945 and the bewildered Red Army facing the Germans on 22 June 1941 is a vivid demonstration of how well the Soviet commanders had been trained in the murderously effective school of combat in four years.

17. THE SOVIET AIR FORCE IN WORLD WAR II: AN ANALYSIS⁸¹

The Red Air Force started the war under bad auspices when it took its murderous licking in 1941; just how many planes were lost is a debatable statistic, although 10,000 would seem a reasonable figure. A high percentage of the Soviet aircraft were destroyed on the ground and thus did not entail the loss of pilots and navigators,

⁸⁰ *Soviet Air Force in World War II*, p. 368.

⁸¹ For an analysis of the Soviet Armed Forces as a whole, see K. R. Whiting, *The Development of the Soviet Armed Forces, 1917-1972*, pp. 59-64.

a factor that was to loom large in favor of the Soviets when aircraft became available in respectable numbers in 1942. It was easier to replace a destroyed aircraft than an experienced pilot. By the spring of 1942 the Soviet aviation industry, after its migration to the east, was again rolling out the planes, at least enough of them to put the Red Air Force back in business. In addition, by November 1942 the Allies had delivered 3,000 aircraft to the Russians.⁸²

During the Great Patriotic War, the Soviet aircraft industry turned out 125,000 aircraft, while the Germans produced only 100,000 between 1941 and the middle of 1945. The Soviets, however, had only one front to supply while the Germans had several and by 1943 the *Luftwaffe* was keeping the best aircraft at home to fend off the American and British bombers. This left the eastern front with mostly obsolete planes and not too many of those.

Some German historians of the air war in Russia regard the decision not to build, or at least give a low priority to the building of, a four-engine bomber as a fatal mistake. As early as the Battle of Britain in the summer and fall of 1940, the lack of a long-range bomber was one of the deciding factors in the outcome. If the

⁸²Kilmarx, *op. cit.*, p. 184; Soviet historians tend to downgrade U.S. Lend-Lease in general and aircraft in particular. During the Great Patriotic War, the U.S. delivered 14,018 aircraft to the USSR. (Robert H. Jones. *The Roads to Russia: United States Lend-Lease to the Soviet Union*, Norman, Okla., University of Oklahoma Press, 1969, Appendix A, Table II.

German aircraft had been able to range far and wide over all of the United Kingdom and also out to sea along the supply routes, the RAF would have had to disperse its interceptors and radar so widely as to be almost ineffective. But the limited range of the German aircraft restricted their attacks to a definite area, one that could be adequately covered by British radar and interceptors. The situation in Russia in 1941 and 1942 is grist to the mill of these *ex post facto* strategic air warfare buffs. In 1941 the target, in their opinion, should have been the railroads crammed with trains going east loaded with dismantled aircraft plants and skilled workers. But Hitler's Barbarossa directive forbade the diversion of aircraft for the destruction of Soviet industry until the battle was won on the ground with close air support. In 1942 the ideal target was the Soviet aircraft industry, newly established in its eastern locale, but still within range of the *Luftwaffe* planes since the *Wehrmacht* was still pushing forward. The best way to shut off the flow of aircraft to the VVS was to hit the source of supply, the aircraft plants.

But, alas, neither the *Luftwaffe* nor the VVS had the planes for effective strategic air warfare. Both had given lipservice to Douhet while tailoring their respective air forces for close-support and very short-range bombing. The Germans as early as 1936 put the emphasis on dive-bombers, especially the Ju 87 *Stuka*. All German bombers were to have a dive-bomber capability, even the 30-ton He 177, a requirement that blocked any effective strategic-bomber design.

When the Germans were able to carry out *Blitzkriegs* in restricted areas such as Poland and the Low Countries, areas in which they could quickly gain and maintain air superiority, the slow and lumbering *Stukas* were effective, especially against armored forces, communications, and even streams of refugees. But when, as in the endless tracts of Russia, air superiority went to the enemy, then the Ju-87 was a sitting duck for the faster Soviet aircraft, particularly when the *Stuka* was coming out of a dive.

Even those bombers which could have gone after vulnerable points in the Soviet rear areas, bombers such as the He 111 and the Do 17, were used mainly to aid the troops in a close-support role. The Soviets used their bombers in a similar manner. As one German historian put it: ". . . strategic air warfare played no role in Germany's campaign against Soviet Russia."⁸³ He might have added that the Soviet campaign was just as weak on the strategic side. But there was no urgent need for the Russians to go in for strategic bombardment of the Reich inasmuch as the American and British bombers were taking care of that task by 1943.

Another *Luftwaffe* deficiency helped the Russians enormously, namely the shortage of transport planes. The main transport from the German involvement in the Spanish Civil War in 1936 until the end of World War II was the Ju 52, a three-engine relatively light and definitely slow monoplane. Even that was not produced in

⁸³Richard Suchenwirth, *Historical Turning Points in the German Air Force War Effort*, USAF Historical Division, Air University, 1959, p. 77.

sufficient numbers to serve all the *Luftwaffe* air fleets. As it was also the main trainer in German flying schools, the output of pilots was constantly hampered when the air fleets requisitioned both Ju 52s and instructors to fly them during the frequent emergencies.⁸⁴ The fact that the Ju 52 was the transport workhorse for such a long period would seem to demonstrate an obtuseness on the part of the *Luftwaffe* high command about the value of air transport, especially in an area as vast as Russia. The disastrous attempt to airlift supplies into the Stalingrad "Kessel" seems to have had little influence on the thinking of the *Luftwaffe* high command during the last three years of the war.

As one authority has pointed out, the war in the East was determined on the ground by the *Wehrmacht* and the Red Army and it was an "Army show." Neither the *Luftwaffe* nor the Red Air Force played more than a supporting role, although a valuable one at times.⁸⁵

⁸⁴ *Ibid.*, pp. 20-27; Suchenwirth says that Goering had a distaste for transport pilots as did his deputy, Jeschonnek, both old fighter jockeys (p. 3 and 4).

⁸⁵ Flocher, *op. cit.*, p. xi.

CHAPTER IV

SOVIET AIR POWER AT HOME AND ABROAD (1946-1964)

During World War II the Soviet Red Army had been forced to trade enormous areas of the homeland at a fearful cost in lives and property in order to gain the time necessary to organize and deploy superiority in manpower, artillery, tanks, and aircraft. The United States, because of its geographical location, however, made its main contribution to the war effort by acquiring control of the seas and by creating a strategic airforce. It also emerged from the war with a monopoly in atomic weapons, an awesome complement to its strategic delivery capability. In other words, the Americans, fighting the war on a world-wide scale, developed the weapons and strategic concepts to cope with enormous theaters, while the Soviets, fighting for all intents and purposes a local war using battering ram tactics, did not develop either the weapons or the doctrine for global conflict. Thus at the end of the war, the two super-powers were asymmetrical in both weapons systems and strategical concepts.

Stalin, probably well aware of the vulnerability of the Soviet Union to attack by U.S. bombers carrying atomic weapons and also conscious of the Soviet inability to hit the American homeland in retaliation, launched an all-out effort to obtain a nuclear capability and a credible air defense. In the meanwhile, he could do

little but shout loudly that long-range bombers and atomic bombs were "paper tigers." To make his contemptuous assessment of the U.S., strategic capability convincing, he promulgated his own military doctrine.

His military doctrine can be easily summarized as it was appallingly simple, or even trite. Using Marxist "military science" in contrast to the bourgeois "military art," Stalin was able to appraise correctly the economic and moral capabilities of the enemy. Having thus ascertained the correct "correlation of forces," he was then able to come up with a winning strategy. The key to this Stalinist doctrine was the concept of "permanently operating factors," supposedly developed by him between 1918 and 1945, namely: *stability of the rear, morale of the army, quantity and quality of divisions, equipment of the army, and organizing talent of command personnel.* Sometimes a sixth factor was added: the importance of reserves. It is hard for any non-Soviet observer to see how any military leader, be he bourgeois or Marxist, could argue with these factors, but it is equally hard to see why one has to be a Marxist to abide by them. These principles have been kicking around in military schools for ages.

In contrast to these "permanently operating factors," Stalin also enumerated some "transitory or fortuitous" factors that could not bring victory. These included "surprise attack," "outstripping the opponent in speed of mobilization," and "experience in warfare," i.e. all the factors that had enabled the Germans to punish the

Soviets so severely in 1941 and 1942. But the Germans lost the war, ergo, those factors must be "transitory." Furthermore, to admit that a well-planned surprise attack could importantly influence the course and outcome of a war would be to admit that the Americans with their strategic air and atomic bombs were in an extremely advantageous position.

In retrospect, however, one may legitimately speculate on how effective the U.S. strategic aircraft and the "bomb" would have been in inflicting unacceptable damage on the USSR in the 1946-50 period. Herman Kahn¹ suggests that the American strength during the first five or six years after the war was far less than generally supposed at the time. For one thing, the Soviet Union had absorbed far more devastation at the hands of the Nazis in 1941-45 than the U.S. bombers could have delivered in the late 1940s--there were just not enough atomic bombs available in that period. Furthermore, as Samuel P. Huntington points out, between 1946 and 1950, there was a military balance between the Red Army and the American atomic bomb since the former held Western Europe in hostage, while the latter held the cities of Russia hostage against a Soviet march to the English Channel.²

To some extent Stalin's military doctrine seems to have been practical given his objectives, namely the acquisition and consolidation

¹*Thinking About the Unthinkable*, New York, Horizon Press, 1962, p. 103.

²*The Common Defense: Strategic Programs in National Politics*, New York, Columbia University Press, 1961, p. 59.

of the Soviet "empire" in Eastern Europe. What better tools were there for such a task than enormous ground forces and a large tactical air force? Even as late as 1956 in Hungary and 1968 in Czechoslovakia, Stalin's successors found hard-hitting armored forces more usable than stockpiles of nuclear warheads and strategic vehicles to deliver them. In short, Stalin's objectives lay on the periphery of the Soviet Union, in both Europe and Asia; his was a continental strategy and he apparently had little intention of trying to project Soviet power beyond areas peripheral to the Soviet Union. It had to wait upon his successors, Khrushchev and Brezhnev, to aspire to an extra-continental strategy.

Beneath the facade of a stagnant-looking military doctrine, Stalin and his closest advisors were desperately trying to get the very weapons systems they were publicly decrying. Enormous amounts of scarce resources and even scarcer technical personnel were poured into research and development of the weapons not encompassed in Stalin's overt doctrine. By 1949 the Soviets had an atomic device and by 1953 had tested a fusion weapon. Such programs are not initiated and successfully carried out without the diversion of prodigious amounts of resources and hordes of scientists and technicians from other sectors of the economy. And this all took place in a Soviet Union that was trying to recover from the hideous damages of the Great Patriotic War.

18. BUILD-UP OF THE AIR DEFENSE SYSTEM

In the face of the American strategic threat, the Soviet planners

gave a very high priority to the creation of an effective air defense system, which in that period meant the development of jet interceptors, antiaircraft guns, and radar networks. These three elements were the responsibility of the Air Defense Command (*Protivo-Vozdushnaya Oborona*, or PVO). PVO had not been pushed too hard during the war in defending against *Luftwaffe* bombers since the Germans, like the Russians, concentrated on close support of the ground forces.³

The ZA-PVO (*Zenitnaya Artilleriya*), the anti-aircraft sector of PVO, had not demonstrated an outstanding capability during the war. An example of its relative ineffectiveness was its inability to prevent the *Luftwaffe* from destroying fifty U.S. B-17 bombers on the American base at Poltava in the Ukraine in June 1944. The Russians fired some 28,000 rounds of light and heavy shells into the night with little idea of what they were supposed to be aiming at.⁴ Nor was the interceptor element, or IA-PVO (*Istrebitel'naya Aviatsiya*), a very effective force during the war as the main effort on the part of the fighter aircraft was close support for the ground troops. But neither anti-aircraft guns nor interceptors were likely to be successful against American bombers without an efficient early-warning network of radars, something the Soviets lacked at the end

³Garthoff, Raymond, *Soviet Military Doctrine*, Glencoe, Illinois, The Free Press, 1953.

⁴*Ibid.*, p. 358.

of the war.

Utilizing captured German early-warning radar equipment as well as German technicians, the Soviets were able to set up relatively effective radar installations for the detection of unfriendly aircraft approaching the Eastern European borders and along the Baltic coast. By 1950 some radar capability had been extended as far as the Pacific coast of the Soviet Union.⁵

The appearance of jet aircraft in the last months of World War II meant that Soviet designers of both airframes and engines had to face up to a new era in aviation. Just before the end of the war, the Soviets captured some German BMW-003A and Junkers JUMO-004A jet engines and they instituted an intensive program of copy-catting. But then the war ended and the Russians came into possession of German aircraft factories, designers, and a number of JUMO-004 engines. The Russian-built BMW-003 became the Soviet RD-20 (*Reaktivny Dvigatel'*, or *Jet Engine*) and the JUMO-004 became the RD-10. Yakovlev put the RD-10 into his Yak-3 piston-engined fighter and called it the Yak-15, flight testing it in April 1946.⁶ Mikoyan and Gurevich began from scratch and came up with a completely new aircraft. They used the RD-20 engine and their new fighter, the MiG-9, was first flown on the same day as Yakovlev's Yak-15. A limited number of both aircraft were produced and put into squadron use, largely to train Soviet

⁵ Lee, Asher (editor), *The Soviet Air and Rocket Forces*, New York, Praeger, 1959, p. 121.

⁶ Nowarra and Duval, *Russian Civil and Military Aircraft, 1884-1969*, London, Fountain Press, 1971, p. 152.

pilots--an "interim aircraft" while the Red Air Force waited "for better things to come."⁷

The relatively low-powered RD-10 and RD-20 engines just did not provide enough thrust to suit Yakovlev and Mikoyan. Then came an unexpected bonanza--the British agreed to sell the Russians 25 Rolls-Royce NENE and 30 Derwent V centrifugal-flow turbojet engines which began to arrive in Russia in 1947. With more powerful engines available, Soviet designers were able to go full steam ahead. Mikoyan and Gurevich installed a Rolls-Royce NENE in the proto-type of their new fighter, the MiG-15, and when it went into production it was powered by a Russian-built copy labelled the RD-45.

The MiG-15, first flown on 30 December 1947, was a break-through in Soviet aviation. During 1948 a large number of MiG-15s went into service in the Red Air Force fighter units. In the meanwhile, engine-designer Klimov souped up the original NENE and his VK-1 engine had over 6,000 lb. thrust and was used to power the MiG-15bis, which became the main fighter aircraft in the Soviet Air Forces by 1950.⁸ Before being replaced by the MiG-17 in 1953, some 15,000 MiG-15s were produced.

Although Mikoyan and Gurevich came up with the winner among the fighters produced in the immediate postwar period, the design bureaus of Yakovlev, Sukhoi, and Lavochkin were in there pitching. But

⁷*Ibid.*, p. 153.

⁸Nowarra and Duval, p. 168.

Sukhoi's Su-9, closely modelled on the Messerschmitt Me-262, and Lavochkin's La-150 never got into production. The MiG-15 was king of the fighter roost during the 1948-53 period.

19. KOREAN WAR AND RUSSIAN INVOLVEMENT

By 1950 the Soviets had the ingredients of an effective air defense system: the radar, the anti-aircraft guns, and the interceptors. The Korean War (1950-53) gave them a chance to test the system. During those three years Korea was like a testing laboratory in which the Soviets could evaluate the performance of their radar, their anti-aircraft artillery, and their interceptors as these were used in actual combat against their American counterparts.

The North Korean Air Force (NKAF), created by the Soviets at the end of the 1940s, was equipped with some 150 obsolete Soviet planes, mostly Yak-7s and Il-10s. To make matters worse, the North Korean pilots were extremely short on flying experience and completely lacking in combat experience. Although capable of handling the almost non-existent South Korean Air Force, the NKAF was no match for the pilots of the U.S., Far Eastern Air Force (FEAF), who were fighting in Korea almost at the outset of the war. The result was sheer disaster for the NKAF and by early August 1950 the North Koreans had only 35 operational aircraft left. This allowed the UN aircraft to roam the Korean skies without hindrance and the UN aircraft carriers to hug the Korean coast when launching air strikes. Furthermore, the obsolescence of the NKAF aircraft permitted the UN forces to use piston-engined aircraft during the first months of the war.

It would seem in retrospect that the Soviets either did not anticipate the intervention of the U.S. Air Force when they unleashed Kim Il-sung, or else they felt that the North Koreans were not capable of operating an Air Force able to stand up to FEAF. Certainly, the generous supply of sophisticated armament going to the North Korean ground forces was incomparably superior to the obsolete crates doled out to the NKAF. Whatever the reasons, the Soviet goof made it possible for the UN forces to hang in for the first three months of the war thus frustrating the North Korean *Blitzkrieg*.

The break-out of the UN forces from the Pusan perimeter in mid-September combined with MacArthur's Inchon landing caught the North Koreans between the "hammer and the anvil" and their armies ceased to be viable military forces by the end of September. The UN forces crossed the 38th Parallel and headed for the Yalu River, an action that brought the Communist Chinese into the war.

The Chinese People's Air Force was a Johnny-come-lately, dating only from 1948, when the first aviation training school was established in Manchuria. In 1949, Liu Ya-lou, then chief of staff of Lin Piao's Fourth Army, was made head of the new air force, which had a total of around 100 decrepit planes. This was indeed a modest beginning--a non-flying commander-in-chief and a mixed bag of old crates. The deterioration of the situation in Korea, however, left the Soviets with the unpalatable options of either building up the Chinese air force or supplying air support in Korea themselves. They chose the first option. In late 1950, an all-weather airfield and a radar

network were constructed at Antung in Manchuria just over the Yalu. A steady flow of MiG-15s went to the Chinese and a whole new ball game was inaugurated in the air war over Korea. As early as 1 November 1950 a UN Mosquito pilot sighted a MiG-15 with Chicom markings, and it was immediately realized that the advent of the MiG-15 in Korea meant that every American plane in the Far East was now obsolete. Fortunately for the UN forces, the Communists did not go for control of the air in November, and this reluctance gave the Americans a chance to get their newest fighter, the F-86A Sabre, to the Korean theater.

The Sabre, first flown in May 1948, was roughly a contemporary of the MiG-15. Like the MiG, it had a swept-wing design derived from the *Luftwaffe*, and its 5,200-pound thrust engine was about the equivalent of the MiG-15's RD-45 engine. On 17 December 1950, pilots of the 4th Fighter-Interceptor Wing took off from Kimpo Airfield and headed their Sabres for the Yalu, where Lt. Col. Hinton chalked up the first MiG-15 to be destroyed in air-to-air combat.⁹ In the next two weeks the 4th Wing pilots had a chance to compare their F-86A Sabres with the Chinese Air Force's MiG-15s. The consensus of the pilots was that the MiG had a better climb rate and a smaller turning radius at high altitudes. However, the MiG's instability at high speeds and its inferior armament made the aircraft "an inferior piece of shooting equipment."¹⁰ It was obvious, however,

⁹Futrell, Robert F., *The United States Air Force in Korea, 1950-1953*, New York, Duell, Sloan and Pearce, 1961, p. 235.

¹⁰Lee, Asher, *The Soviet Air Force*, New York, John Day, 1962, p. 119.

that the two fighters were evenly matched and the 4th Wing pilots quickly realized the necessity of working out effective tactics. The Sabre patrol was standardized at 16 aircraft, 4 flights of 4 each. The flights arrived at 5-minute intervals at different altitudes and entered the patrol area at speeds of at least 0.85 mach. The patrol period was 20 minutes, which allowed the Sabres 10 minutes to stay and fight if MiGs attacked. On 22 December, the 4th Group demonstrated the effectiveness of these tactics when two Sabre flights led by Lt. Col. J. C. Meyer fought it out with 15 MiGs and destroyed 6 of them.¹¹ By the end of December, the 4th Wing had flown 234 sorties and downed eight MiGs, had two probables, and damaged seven others.

The build-up of the Chinese People's Air Force continued apace and by early 1951 Liu Ya-lou had over 1,000 aircraft under his command, including 400 MiG-15s, operating off a complex of airfields in Manchuria, the most important of which was the forward fighter base at Antung. Against these assets were counterpoised some liabilities. If Liu succeeded in hurting the UN forces too badly, would he be allowed to retain his "sanctuary status" in Manchuria? There were voices in America advocating the bombing of Manchuria and some even wanted to use atomic bombs to accomplish the job.¹² This sobering thought, the U.S. bombing of the Manchurian bases,

¹¹Futrell, *op. cit.*, p. 235.

¹²Whiting, Kenneth R., "The Korean War" in J. H. Scrivner, Jr. (editor), *A Quarter Century of Air Power*, Air University, Maxwell AFB, 1973, p. 38.

was always with the Chinese leaders, and probably with their Soviet mentors, and as a consequence there was a good deal of backing and filling in the implementation of the Communist air strategy. Furthermore, General Liu's best aircraft, the MiG-15, was short on range and from its Manchurian bases could only attack targets within 100 miles of the Yalu. His most important liability, however, was the lack of skilled pilots. They needed lots more training before they could hope to match their opponents in flying ability and shooting accuracy.

With the range liability in mind, Liu drew up the following plan: his MiGs based at Antung should attempt to wrest a zone of air superiority over northwestern Korea; once superiority was attained, then forward bases could be constructed in North Korea down to the region of the 38th Parallel. The battle raged during the first three months of 1951, but the laurels went to the UN pilots. After the unsuccessful attempt of the Chinese to construct forward airfields in North Korea itself, the MiG-15s were restricted to operations in northwestern Korea, the famed "MiG Alley." The American pilots began to recognize certain of their opponents in MiG Alley as much more proficient than the run-of-the-mill fighter jockeys they had previously engaged. These "honcho" pilots were either Soviet or Chinese instructors flying combat to beef up the morale of their students and to learn at first-hand the tactics of the UN pilots.

With the beginning of the armistice negotiations in July 1951,

the air war in Korea was a constant struggle to gain control of the air north of Pyongyang. The Chinese, with nearly 600 MiGs, put the Sabre pilots to the test in MiG Alley and in the fall of 1951 the Chinese got a better machine, the MiG-15bis with a 6,000-pound-thrust engine designed by Klimov. In December the air war was fast and furious, with the Sabre pilots again victorious. By the end of December the Chinese gave up any attempt to wrest air superiority from the UN and began to follow a cyclical pattern of air operations obviously aimed at providing combat training for as many pilots as possible. Each "class" began flying high and avoiding combat, and as the "class" became more proficient, it also became more belligerent. Then the "class" graduated and the cycle was repeated.¹³

The B-29 medium bomber sang its swan-song during the Korean War. As early as April 1951, UN B-29s, escorted by F-84 Thunderjets, ran into sheer disaster while trying to destroy bridges in northwestern Korea. By late fall, since there were not enough Sabres available to provide escorts for the bombers, the B-29s converted entirely to night bombing, using short-range navigation (SHORAN) system as their principal method. This worked during the winter months of 1951-52, but, by June, the Chinese, employing a combination of searchlights, flak, and MiGs, were able to exact a heavy toll of B-29s. Darkness

¹³Futrell, *op. cit.*, p. 387.

was no longer an adequate cover for B-29 operations. In 1953 the use of electronic counter-measures, compression of the bomber streams over the target area, and multiple SHORAN aiming points helped to keep the losses down, but the B-29s were no longer sent into the area between the Chongchon and Yalu rivers on bright moonlit nights or when the weather conditions were conducive to the formation of contrails. The ageing aircraft was on the edge of catastrophe during 1953 and if the Russians had been able to supply the Chinese with airborne radar on their interceptors, the B-29 would have been doomed.

By mid-1952, the Chinese People's Air Force had nearly 2,000 planes, including over 1,000 jet fighters; the Chinese, moreover, had constructed four more airfields in the Antung complex, thus insuring their capability to keep hundreds of MiGs just beyond the Yalu. The U.S. F-86F, which began to arrive in the Far East in June 1952, was a match for the MiG-15*bis*, and in the fall of 1952 the ratio of MiG kills was eight to one, 123 MiGs shot down in three months. MiG Alley was again becoming Sabre Alley and the Chinese pilots lost their belligerency. Even more to the point in the overall context of the cold war, the Soviet leaders were being made conscious of the danger of tackling the U.S. Air Force in other arenas of potential conflict, as well as being hit in their pocket-book as the toll of MiGs mounted.

The Soviets, however, had some gains from the Korean War: they were able to blood some of their pilots; they were able to gain

first-hand experience in coping with U.S. tactics and strategy in air warfare; and they were able to test their early warning systems and their aircraft under combat conditions. The loss of approximately 3,000 aircraft, some 2,000 of which were MiGs, was the price paid-- but the bill went to the Chinese, who later revealed that they were charged by the Soviets for the war materiel provided them in the Korean War.

20. RESUSCITATION OF THE LONG-RANGE BOMBER FORCE (DA)

While testing the air defense system in the Korean War, the Soviets were simultaneously pushing ahead in the acquisition of long-range offensive weapons systems, especially long-range bombers. They had tested their first atomic device in 1949 and in August 1953 came up with a thermonuclear bomb. The main problem, however, was how to deliver the new weapons of mass destruction on an opponent located thousands of miles away. The Soviet strategic bombers had played a modest role in World War II, and only a small percentage were four-engined Petlyakov Pe-8s. In 1946, Stalin, apparently impressed by the damage wrought upon Germany by the strategic bombers of his erstwhile allies, decided to recreate his strategic air arm. This time it was designated Long-Range Aviation (*Dal'naya Aviatsiya*, or DA).

Fortunately for the Soviets, the forced landing of three B-29s and the crash landing of a fourth in the Soviet Far East in 1944 provided them with a ready-made model for a long-range aircraft. Gurelev was charged with the task of copying the B-29's airframe

and A. Shvetsov with duplicating the aircraft's engine. In just one year Tupolev and Shvetsov produced a prototype, tested it, and had the aircraft in production by March 1945. The Soviet version of the B-29 was labelled the Tu-4, later designated as BULL by NATO, and it was powered by Shvetsov's copy of the Wright Whirlwind engine called the ASh-90. The DA had three air armies of Tu-4s by 1953, some 1,000 aircraft. But even with inflight refueling and operating through Arctic bases, the Tu-4 only had legs for a one-way mission to most targets in the United States. Furthermore, the inability of the UN B-29s to operate in daylight against MiG-15s in the Korean conflict must have been discouraging for Marshal Golovanov and his DA, and his Tu-4s lacked the radar bombsights and the long-range navigational gear so necessary in carrying out night attacks. As a vehicle for strategic bombing, the Tu-4 was obsolete by the end of the Korean conflict.

In the meanwhile, the main opponent, the United States, was busy beefing up its Strategic Air Command (SAC). During 1948, two new bombers were put in service: the B-50, a follow-on improvement of the B-29, and the B-36, a huge, six-engine bomber with a range of 10,000 miles. The first B-47 Stratojets came into the SAC inventory in late 1951, the first of the American all-jet bombers. By the end of 1954, all the B-29s were gone and the B-50s were being rapidly retired. Then came the champ, the B-52, in 1955 to replace the B-36. The B-47 Stratojet had a relatively short range, about that of the B-29, but the U.S. forward bases in Europe, Asia, and

North Africa meant that it was capable of reaching most targets in the USSR. It is little wonder that the Soviets were anxious to get a retaliatory vehicle, a long-range bomber that could reach the heart of the United States.

The main impediment to the development of an effective Soviet DA was the lack of powerful jet engines. It was not until 1953 that Mikulin came up with a 10,000 pound-thrust turbojet. In the meanwhile the Soviet designers of airframes had to make do with the offspring of the Rolls-Royce NENE and the Derwent engines. Il'yushin began work in 1946 on the design of his IL-22, now officially recognized as the first Soviet jet bomber, although only one prototype was built and flown. The IL-22 was a four-engine, all-metal bomber powered by four Lyul'ka TR-1 turbojets with 2,860 pound-thrust. Its top speed was around 450 mph and it had a range of 1,200 miles. The plane was first flown in July 1947.

Il'yushin's next bomber, the IL-28, the equivalent of the British Canberra, was the first Soviet jet bomber to go into production. A twin-engine, all-metal aircraft, powered by the "Russianized" Rolls-Royce NENE, the Klimov RD-45, with 5,000 pounds of thrust, the IL-28 had a top speed of just over 500 mph at 16,000 feet and a maximum range of 1,600 miles. Later models had the Klimov VK-1 engines with 7,500 pounds of thrust. Although test flown in August 1948, it was first seen by the public at the 1950 May Day fly-by over Red Square. Il'yushin had to strive mightily to produce the 25 IL-28s Stalin demanded for that celebration.¹⁴ Il'yushin also

¹⁴Alexander, Jean, *Russian Aircraft Since 1940*, London, Putnam, 1975, pp. 116-18.

produced a recce version, the IL-28R (*Razvedchik*), and the IL-28T (*Torpedonosets*) torpedo bomber for the Navy. The IL-28, whose NATO designation is the BEAGLE, was a definite winner. Several thousands were produced and over 1,000 exported to satellite and friendly (to the USSR) nations. Many are still in service.

In late 1952, Tupolev's design bureau began work on the Tu-16 bomber, originally called the Tu-88 or *Samolet "N."* The proto-type was flown first in 1953 and series production began in 1954. The Tu-16, called the BADGER by NATO, was a twin-engine, swept-wing monoplane powered originally by Mikulin AM-3M 18,000 pound-thrust engines. The Soviet counterpart of the American B-47, the Tu-16, with a top speed of slightly over 600 mph and a range of only 3,500 miles was not the intercontinental bomber the VVS command was looking for. Unlike the B-47, the Tu-16 had no convenient forward bases from which to operate against the United States homeland. It was, and is, a good bomber and some 2,000 were produced. The public was first introduced to the BADGER at the 1955 Tushino fly-by.¹⁵

Then, in May 1954, the Mya-4, NATO designation BISON, made its first public appearance. V. M. Myasishchev, who had worked in Tupolev's design bureau in World War II, became a lecturer at the Moscow Aviation Institute in the immediate postwar period. In 1949, however, he was ordered to set up a new design bureau and to get to work on a new long-range strategic bomber.¹⁶ His Mya-4, a

¹⁵*Ibid.*, pp. 373-78; Nowarra and Duval, *op. cit.*, p. 181.

¹⁶Alexander, *op. cit.*, p. 290.

four-engine, sweptwing machine was powered by the same Mikulin AM-3M engines as the Tu-16. The Myasishchev bomber has a top speed of 620 mph and a range of around 6,000 miles.

In the following year, at the 1955 Soviet Aviation Day celebration, the Tu-20, NATO BEAR, made its public debut. The Tupolev OKB called it the Tu-95 while it was in the design and prototype stages, but it received the designation Tu-20 when it went into service in 1957. The new bomber was a four-engine turboprop powered by Kuznetsov NK-12M engines, each producing 12,000 shaft horsepower. Its maximum speed was over 500 miles an hour at 40,000 feet, it carried a bomb load of 25,000 pounds, and had a range of over 7,500 miles. The most remarkable feature of the BEAR is the five-meter diameter propellers which have a tip speed of Mach 1.08, i.e. are supersonic.¹⁷ In 1956 a civil transport version of the Tu-20, the Tu-114 *Rossiya* (NATO CLEAT), appeared and went into service with *Aeroflot* as its longest-range aircraft. The total production of Tu-20s was around 300 and most of them are still in service.

The Soviet Air Force had three strategic bombers by 1955 (BEAR, BISON, and BADGER), but it was not until the end of the 1950s that DA had enough of them to poise a credible threat to the United States. It would seem that during the 1955-58 period, Khrushchev's boastings about an effective Soviet strategic capability and the VVS's ability to mount a pre-emptive attack to thwart any U.S. nuclear strike before it got started was sheer bravado. It is extremely unlikely

¹⁷*Ibid.*, p. 385.

that the Soviet DA could have inflicted unacceptable damage on the United States in that period.

Actually, until the fall of 1957, the Soviets were simply responding to an American lead in strategic weapons. Even geography was against them. Their forward bases on the northern coast along the Arctic Ocean and on the Arctic islands of Severnaya Zemlya, Novaya Zemlya, and Frants Josef Land were more than offset by the U.S. bases closely ringing the Soviet Union. DA's inventory of long-range bombers, although somewhat similar to that of the United States in types, was very inferior in numbers. A doctrine of pre-emption may have been a measure of desperation, but it was the only doctrine the Soviets had to keep up their morale. If they had too little to pre-empt with, they certainly had far too little to retaliate with after an American attack.¹⁸

21. ADVENT OF THE ICBM

The advent of the ICBM and the successful launching of the Sputnik in 1957 had a miraculous effect on the Soviet attitude in the strategic debate with the United States and Khrushchev soon began to make noises about Soviet superiority in strategic weapons. Early in 1957 he relegated bombers to the museums, and seemed determined to make long-range missiles the be-all and end-all of military strategy. Looking back at this display of cockiness, it is hard to discern

¹⁸Whiting, K.R., *Soviet Reactions to Changes in American Military Strategy*, Air University, Maxwell AFB, 1965, p. 11.

anything except a bold gamble on a psychological advantage. The West was in a mild state of shock and Khrushchev was cashing in on it. Of course, there is the fact that this was the first time that the Soviets had a military "first," a weapon that was not merely a duplication of something already in the United States arsenal.

Khrushchev did brandish his new ICBM's as an implicit backup to his Berlin ultimatum in November 1958. On the other hand, he showed a reluctance at allowing Mao Tse-tung to suck him into an actual confrontation with the United States in the case of the 1958 Taiwan Straits crisis. The wind might be blowing from the East in Mao's opinion, but Khrushchev was more aware of how little force there was behind that wind.

This brings us to the question of why the Soviet did not, apparently, maintain their lead in ICBM's. On the surface it looks much like their failure to produce *Bisons* at the rate American intelligence judged them capable of; in short, the lack of economic resources. Khrushchev had overextended his commitments. As early as 1953-54, during the Malenkov-Khrushchev duel for power, it is evident in retrospect that Malenkov realized that something had to give if the Soviet economy was not to be seriously over-strained. The Malenkov policy of easing up on military spending and on investments in heavy industry would have allowed the allocation of more funds in the consumer goods industries and in agriculture, the two weakest segments in the overall economic picture. Khrushchev, seeking the support of the military leaders and the conservative majority of the Party leadership, gambled on the traditional system lasting

long enough to enable him to get a vastly improved military stance before he had to tinker with the obsolete economic machinery. Thus the period after 1955 saw an unusually heavy commitment in military hardware, research and development, and manpower.

By 1958 Khrushchev saw how over-extended he was in his "races" with the United States. He was racing the United States in space, in armaments, in economic aid to underdeveloped countries, and in economic growth in general. All this on half of the American GNP. At this point Khrushchev tried to back off a bit. He began to seek a detente with the West, which led eventually to Camp David in late 1959, and he also began to try to renege on his military expenditures.

In this tight economic situation, Khrushchev seems to have been unwilling to put up the wherewithal necessary to push ICBM's off the production line like "sausages," as he once put it. The liquid-fuel ICBM of that period was an extremely expensive and complicated gadget. Furthermore, it was not adaptable to hardened sites, and therefore was vulnerable to American attack. Whatever the reasons may have been, the Soviets did not produce their new ICBM's as fast as Western intelligence estimated.

Khrushchev's famous speech to the Supreme Soviet on 14 January 1960 set the tone for what seems to have been a "behind-the-scenes" controversy between him and his military leaders.¹⁹ This speech

¹⁹ *Pravda*, 15 January 1960, pp. 1-5; a complete translation in *The Current Digest of the Soviet Press*, XII, No. 2 (10 February 1960), pp. 3-16.

revealed a Khrushchev intent on cutting military manpower in the interests of economy and justifying the cut by shouting shrilly that the Soviet deterrent force was capable of keeping the West at bay. Almost at the beginning of his long harangue he stated his main premise: "We are several years ahead of other countries in the development and mass production of intercontinental ballistic missiles of various types." As a result, even "the statesmen of the Western nations, including the U.S.A. itself," agree that the launching of the Soviet satellites and space rockets have made the American people aware that the U.S.A. is militarily no less vulnerable than any other country. Khrushchev then went on to use this shaky premise as a justification of his proposed drastic cut in military personnel.

In the course of his speech, Khrushchev produced a number of interesting figures on the size of the Red Army between 1945 and 1960. Between 1945 and 1955 the Armed Forces had been reduced from 11,365,000 men to 5,763,000 men, and between 1955 and 1958 another 2,140,000 men had been demobilized. Thus the total was 3,623,000 in January 1960. Khrushchev now wanted to carry out a further reduction of 1,200,000 men, thus bringing the total military personnel in the Soviet Armed Forces down to 2,423,000 men.

The irrepressible Mr. Khrushchev then asked: why not? The Soviet Union had an adequate stockpile of atomic and hydrogen weapons and a "powerful rocket technology" in a period when the armed forces have been largely converted to rocket and nuclear weapons." As for

the more conventional types of armaments, Khrushchev's own words best express his thoughts on that subject:

Given the present development of military technology, military aviation and the navy have lost their former importance. This type of armament is not being reduced but replaced. Military aviation is being almost entirely replaced by rockets. We have now sharply reduced and probably will further reduce and even halt production of bombers and other obsolete equipment. In the navy the submarine fleet is assuming great importance, and surface ships can no longer play the role they have played in the past.

The new armaments, the phenomenal growth rate of the Soviet economy, and the "consolidation and growth of the mighty socialist camp" all added up to a relatively unassailable USSR in Mr. Khrushchev's opinion. Furthermore, a country's defense capability was no longer determined by the number of soldiers it had under arms, but rather upon its total firepower and means of delivery. And the Soviet Army had these in great abundance, he asserted.

The proposed manpower cut, he went on to maintain, would "help to build our economic might and to create additional possibilities for raising the standard of living, further increasing material goods, developing housing construction and shortening the working day." It would yield an annual saving of approximately 16 to 17 billion rubles. It would seem that Khrushchev anticipated some opposition from his marshals and was holding out these economic goodies to win popular support for his program.

22. FIGHTER DEVELOPMENT (1953-64)

While Nikita Khrushchev was inveighing against conventional weapons systems, surface ships, tanks, and aircraft in particular,

during the late 1950s and early 1960s, the VVS was busy bringing new types of aircraft into its inventory. This included, in the 1953-63 period, a dozen or so new fighters, interceptors, and strike aircraft.

The Mikoyan and Gurevich design bureau^{*} produced the MiG-17, MiG-19, and MiG-21 during that period. The MiG-17 (FRESCO) was a follow-on version of the MiG-15. The state acceptance tests were completed in 1952 and the aircraft went into production immediately, entering service in 1953. Some 9,000 MiG-17s were produced over the next five years. Its wings were more swept back than the MiG-15's, but it was powered with the same VK-1A engine as its predecessor, the MiG-15*bis*. The FRESCO-B, or MiG-17P (*Poiskoviy* = search radar) was equipped with the *Izumrud* (Emerald) radar. FRESCO-C, or MiG-17F (*Forsazh* = afterburner) had a VK-1F engine (the VK-1A with an afterburner) which could boost the thrust to 7,500 pounds. A later model was the FRESCO-D, or MiG-PF (*Poiskoviy s forsazh*), equipped, as the suffix indicates, with both radar and afterburner. The MiG-17F had a top speed of 700 mph at 10,000 feet and a ceiling of 55,000 feet. This popular MiG was produced in Czechoslovakia (the S-104) and in Poland (the LIM-5), as well in India.

The MiG-19 (FARMER), the counterpart of the US F-100 Super Sabre, was the first Soviet fighter with supersonic capability in level

^{*}Gurevich left the OKB sometime in late 1952 or early 1953, apparently for reasons of health. The "G" in MiG, however, was retained in later models although they were designed by Mikoyan.

flight, a maximum speed of Mach 1.4. A later version, the MiG-19SF,* was powered with two Tumansky RD-9B turbojets, each producing around 7,000 pounds of thrust, and it could attain 900 mph at 32,000 feet. The MiG-19 went into series production in 1955 and entered VVS service in the same year. It was first publicly displayed at Tushino in 1956.

The MiG-21 (FISHBED) was smaller than the MiG-19. This light-weight fighter was first flown in 1955 and went into service in 1959. It is a single-engine, mid-delta-wing aircraft and its single Tumansky R-11 engine with 12,000 pounds of thrust with afterburner gives the plane a Mach-2 capability. The Russian nickname for the machine is *Balalaika* because of its delta wing.

Pavel Osipovich Sukhoi, whose design bureau had been abolished in 1949, was back in business immediately after Stalin's death and by 1956 he had produced two new single-engine aircraft. The Su-7 (FITTER-A) is currently the standard close-air-support strike aircraft of Soviet Frontal Aviation. It first appeared as a prototype over Tushino in 1956 and entered VVS service in 1959. It is a large single-engine, swept-wing plane powered by a Lyul'ka AL-7F-1 turbojet which produces 22,000 pounds of thrust with afterburner. The Su-7 has a top speed of 1,180 mph or Mach 1.8 at 40,000 feet and has a service ceiling of 50,000 feet. Several thousand Su-7s have been manufactured during the last 15 years.

* The "S" in the suffix signifies *Stabilizator* referring to the new all-moving slab-type empennage.

The other Sukhoi aircraft, the Su-11 (FISHPOT) interceptor, was also first displayed at the Soviet Aviation Day flypast at Tushino in 1956. The first production model, FISHPOT-B, went into service with IA-PVO *Strany* in 1961. Although the Su-11 has a fuselage and empennage almost identical with the Su-7, and has the same engine, it differs completely in its wings since the Su-11 has a delta wing instead of the Su-7's 62-degree swept wing. The FISHPOT-C, appearing over Tushino in 1961, had an up-graded Al-7F engine.

Flown for the first time in 1953, the Yak-25 (FLASHLIGHT) was the first really all-weather interceptor to enter VVS service. Production began in 1954. It was a twin-engine, two-seat, swept-wing aircraft powered by two Mikulin AM-5 turbojets producing a 5,000-pound thrust. In 1957, the Yak-25 got the Tumansky RD-9 engine with a 6,000-pound thrust. The FLASHLIGHT's top speed was 630 mph at sea level and almost 700 mph at 36,000 feet.

The largest of the interceptors produced in the Khrushchev era was the Tupolev OKB's Tu-28P (*Perekhvatchik* = interceptor), with the NATO designation of FIDDLER. Flown in prototype in 1957, it came into active service in the early 1960s. It is a twin-engine, two-seat, swept-wing machine powered by two Lyul'ka AL-7F turbojets (14,000 pounds dry, 22,000 pounds reheat). It has a maximum speed of just over 1,000 mph, or Mach 1.65, at 40,000 feet.

Thus during the Khrushchev decade (1955-64), the VVS acquired a stable of first-class fighters, strike, interceptor, and reconnaissance aircraft. It was during this decade that Soviet aviation

ceased to be dependent upon foreign inputs, German or otherwise, and its airframe and engine design bureaus were able to hold their own with the West. The MiG-21s, Su-11s, and Tu-28s were top-rate fighting machines capable of putting up a good show against the best of the West in the early 1960s.

Armament for the fighters produced in the Khrushchev era was adequate, but hardly outstanding. Soviet designers doted on large (23mm to 37 mm) cannon, a tradition that went back to pre-World War times. The MiG-17 and -19 were equipped with one 37mm and two 23mm cannon; the MiG-21 had one 30mm cannon, but it also had air-to-air missiles; and the Su-7 carried two 30mm and the Yak-25 two 37mm cannon.

But the advent of air-to-air missiles (AAMs) made multi-gun armament somewhat obsolete by the late 1950s. The first AAM to appear on Soviet aircraft was the semi-radar-homing ALKALI, observed in the middle of the 1950s. The ALKALI came to constitute the main armament of the MiG-17 and -19 as well as the Su-11. The ANAB, with both infra-red and semi-active radar homing versions, was first seen in 1961. It became the standard armament of the Su-11. The next AAM to appear was the ASH, a large missile with both infra-red and radar-homing versions, and the Tu-28P carries two of them.

The Soviets, however, seemed slow in their development of multi-ejection racks for air-to-ground munitions. While the US fighters in the early 1960s were equipped with triple ejection racks (TERs) and multiple ejection-racks (MERs), the Soviet aircraft continued

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ACADEMIC SERVICES GROUP (3825TH) (AU) MAXWELL AFB AL
SOVIET AIR POWER, 1917-1976.(U)

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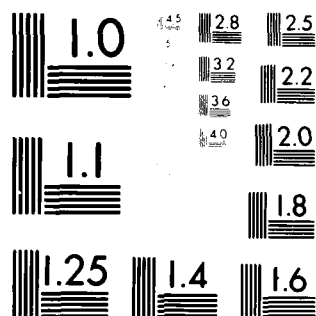
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MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS-1963-A

to have one bomb hung per attachment.²⁰

23. SOVIETS ENLARGE ROLE IN THE THIRD WORLD (1955-64)

It was during Nikita Khrushchev's tour of duty as *vozhd'* of the Soviet Union that the Russians began to play a meaningful role in the Third World. By the time of Nikita's ouster in October 1964, Moscow was deeply involved in the global arena and was playing quartermaster for a number of client and potential-client states in the Middle East, South Asia, Southeast Asia, and, after 1960, in the Western Hemisphere.

Stalin, committed to a "continental strategy," had played only a peripheral role in the Third World, especially after his hatchetman, Zhdanov, advanced the "two-camp" thesis at the founding meeting of Cominform in 1947, a thesis that characterized all nations not "for" the socialist camp as against it and therefore hostile to the Soviet Union. Stalin's successor, Khrushchev, began to soften the Stalinist hard-line in 1955. He and Bulganin, the Soviet Premier, visited Afghanistan, India, and Pakistan, spreading sweetness and light as they went.

The real breakthrough for Soviet penetration of the Third World came with the so-called "arms-for-cotton" deal with Egypt in 1955. Nasser, extremely piqued by the important role given his rival Nuri al-Said, prime minister of Iraq, in the newly created Baghdad Pact,

²⁰Major Eugene E. Habiger, "The Development of Soviet Fighter Aircraft Since 1945--A Historical Analysis," (unpublished research paper), Air University, Maxwell AFB, 1975, p. 26.

and irritated by the reluctance of the Americans to provide what he considered a minimum of arms, turned to the Russians for support. Khrushchev, who looked upon the US-British creation of the northern tier of Turkey, Iraq, Iran, and Pakistan as a barrier to Soviet penetration of the Middle East with alarm and distaste, was delighted to comply with Nasser's appeal. He foresaw the deal with Egypt as giving him a chance to leap-frog the northern barrier and begin wheeling and dealing right in the heart of the Middle East via Nasser's good auspices. In September 1955 an arms agreement was signed, an agreement which provided \$250 million in arms for Nasser in return for a long-term lien on Egypt's cotton. The agreement included the delivery of naval craft, tanks, artillery and aircraft (MiG-15s and IL-28s). Egyptian military personnel were sent to Eastern Europe for training and Soviet military advisers and technicians arrived in Egypt. In the following year, Syria, made suddenly aware of a new source of military weapons, tapped into the Soviet arsenal. Yemen, intent upon ousting the British from Aden, applied for and received its share of the Soviet largesse in military equipment. The Czechs acted as the cover for the Soviets in all three deals.

By the early 1960s, more sophisticated weapons systems were being shipped to Egypt: MiG-21s in 1962 and Tu-16 bombers in the same year, while SAM-2s came into the Egyptian air defense force in 1963. The Syrian and Iraqi air forces were up-graded with new aircraft and SAMs about the same time.

Cairo's Moscow connection irritated Dulles so much that he backed down on the implementation of any US aid for Nasser's pet project, the High Dam at Aswan. In retaliation, Nasser nationalized the Suez Canal on 26 July 1956 and for the next three months the British and French tried to get Dulles to pressure Nasser into some kind of a mutually acceptable agreement. Finally, the French and British concocted a plan with the Israelis: The Israelis were to create a credible threat to the Canal and the Anglo-French forces would then intervene to separate the combatants, with the Anglo-French "interventionists" ending up in control of the Canal.

The Israelis began their attack on 29 October by air-dropping a paratroop battalion near the Mitla Pass, while Israeli aircraft patrolled up to 10 miles from the Canal to both clutter the Egyptian radar and to "threaten" the Canal. The air war between the Egyptians and the Israelis was a restricted one, neither side attacking the other's cities. But on 31 October the Anglo-French bombing of Egyptian airfields began. The Egyptian Air force, taken completely by surprise since Cairo was convinced the British and French ultimatums were bluffs, lost 260 air craft on the ground. Then things began to go sour. The Anglo-French airborne assault on Port Said and Port Fuad was not launched until 5 November and the seaborne assault came a day later. By that time pressures in the UN and in France and England as well forced Eden and Mollet to accept the UN cease-fire.²¹

²¹For a good, short account of the Suez Canal of 1956 with the accent on air power, see Joseph Churba, "Air Power in the Middle East," in Scrivner, *A Quarter Century in the Middle East*, pp. 64-70.

Khrushchev, preoccupied with the revolt in Hungary at the time, was somewhat slow in reacting to events in the Middle East. Once convinced, however, that Dulles was sincere in his opposition to the Anglo-French-Israeli assault on Egypt, Khrushchev jumped in with both feet, as was his wont, by sending notes to Ben Gurion, Eden, and Mollet in which he threatened to launch his rockets at the offending countries and to send Soviet "volunteers" to fight alongside the Egyptians. Given the Soviet missile capability in 1956, his threat of launching rockets on London, Paris, and Tel Aviv was sheer bluff and, in all probability, so was his threat to send "volunteers" to the Middle East. But though Nikita's threats were probably outright bluffs, they, nevertheless, impressed his Arabic audience and they probably also impressed their author himself.

Soviet military aid to South Asia began as early as 1956 when Afghanistan received a dozen MiG-15s, two Mi-4 helicopters, and an IL-14 transport. The Russians also built some airstrips and by 1960 the regime in Kabul was into the Russians for about \$100 million in military goods.²² As the relations between Moscow and Peking worsened in the late 1950s, the Soviets began to look upon India as a potential ally in the containment of the PRC. The Russian attempt to play a neutral role in the Sino-Indian crisis of 1959 over the Aksai Chin Plateau only served to rouse Mao's ire.

²²Wynfred Joshua and Stephen Gibert, *Arms for the Third World*, Baltimore, The Johns Hopkins Press, 1969, pp. 68-72.

In the summer of 1962, the Soviets agreed to supply the Indians with some MiG-21s and to help them build a plant to produce them under license. But the Indo-Chinese conflict over the Northeast Frontier Agency in October 1962 put the Soviets in a bind--how could they in good conscience supply late model fighters to a nation at war with a fraternal Communist country? By December, irritated by Chairman Mao's derisive comments about the ignominious withdrawal of the missiles from Cuba, the Russians were able to shelve their Marxian consciences and go through with the Indian MiG-21 deal.²³

Another major recipient of Soviet military aid in the late 1950s and early 1960s was Indonesia. As an aid to Sukarno's campaign to oust the Dutch from West New Guinea (called West Irian by the Indonesians), the Soviets came through with over a billion dollars in military equipment. Although heavily biased toward naval units, there were over a hundred MiGs involved, including some MiG-21s, the first of that type of aircraft sent to a non-Bloc country.²⁴

Thus in the decade between 1956 and 1965, the Soviets expended nearly two billion dollars on military aid to Afghanistan, India, and Indonesia. Much of the materiel consisted of aircraft, including well over 300 MiGs.

²³*Ibid.*, pp. 68-72.

²⁴*Ibid.*, pp. 64-67; also see Uri Ra'anani, *The USSR Arms the Third World*, Cambridge, M.I.T. Press, 1969, pp. 175-245, for an in-depth study of Soviet economic and military aid to Indonesia.

24. SINO-SOVIET SPLIT (1956-64)

As a result of the lessons learned in the Korean conflict, especially the horrible casualties suffered in trying to overcome the UN superiority in firepower by inundating it with masses of manpower, the People's Liberation Army was reorganized from top to bottom. The introduction of new weapons, largely of Soviet origin, called for a whole new corps of officers trained in the new technological means of warfare, officers capable of supervising the use and maintenance of aircraft, antiaircraft artillery, and tanks. In short, officers who were trained professionals, not just semi-literate enthusiasts.

During 1954 and 1955 the PLA was overhauled and rebuilt, a Ministry of Defense, headed by P'eng Teh-huai, was created, and compulsory military service instituted. Furthermore, the officer corps was made to look more professional by the establishment of a hierarchy of ranks ranging from marshal to lieutenant, a rank system almost identical with that of the Soviet Union. The PLA was in the process of becoming a modern professional military organization and was aping its Soviet mentor all the way.

Semimodernized though it might be by 1955, the PLA still lacked the strategic weapons that made the United States and the Soviet Union the superpowers they were, i.e. it lacked long-range aircraft, nuclear bombs, and sophisticated submarines. It was all well and good to chant Mao's slogan that man was superior to weapons, but even the Soviet comrades had abandoned Stalin's denigration of the

efficacy of nuclear weapons by 1955. Soviet military theorists were now admitting that a surprise attack which utilized nuclear weapons and long-range delivery vehicles could influence the course and outcome of a war. Like Stalin in the late 1940's, however, what could Mao, who lacked nuclear weapons and delivery vehicles, do except refer to them as "paper tigers," for to admit their awesome power would hardly be conducive to raising the morale of the PLA and the Chinese population as a whole.

There then arose a debate between the General Staff military leaders, who stressed the importance of weapons for the PLA, and the more politically oriented leaders in the Ministry of Defense, who continued to beat the drum of Maoist doctrine, the supremacy of man over the weapons. A real doctrinal struggle was shaping up by 1955, and, inasmuch as the only feasible supplies of modern weaponry was the USSR, the debate had a direct connection with Sino-Soviet relations.²⁵ By mid-1955, some top members of the General Staff began to echo the then current Soviet thinking on nuclear weapons; furthermore, they were calling for more and better weapons for the PLA, even if they had to be imported.

The PLA, by 1956, was a hybrid--partly modernized and partly a barely postguerrilla army. The influx of Soviet weapons and equipment had been sufficient to build a respectable air force, which

²⁵The best account of the doctrinal debate in the 1954-60 period is in Alice L. Hsieh, *Communist China's Strategy in the Nuclear Era* (Englewood, N.J.: Prentice-Hall, 1962).

possessed MiG-15s and 17s, a number of IL-28 light jet bombers, as well as a token force of Tu-4s (the Soviet copy of the B-29), probably around 3,000 aircraft in all.²⁶ Furthermore, by late 1956, the first Chinese *manufactured* jet fighters were in the air--*manufactured* meaning *assembled* for the most part. Since the rapid expansion of the air force strained the available training facilities to beyond the breaking point, the Soviets came to the rescue by opening their training installations to Chinese pilots and crews. They also sent instructors along with MiG-15UTIs and IL-28Us for training in China.²⁷ The initial emphasis was on fighter training to defend the PRC against potential Nationalist or American penetration. Although the PLA's air force still had a stock of MiG-15s, as well as some piston-engine La-9s and -11s, the Russians had delivered a sizeable number of MiG-15*bis* and by 1955 some 500 new MiG-17s.

The PLA's bombing capability, however, remained rather primitive compared to the international state of the art. By 1956 it possessed about 250 IL-28 light bombers and about 100 obsolete Tu-4 medium bombers. At the end of the decade, the PLA's capability to launch an effective air strike outside the PRC was marginal at best--all of its bombers were either obsolescent or downright antiquated.

In the mid-1950s the Chinese began to create their own aircraft

²⁶Richard M. Bueschel (*Communist Chinese Air Power*, New York, Praeger, 1968, p. 12) says that by late 1955 the PLA had almost 4,000 aircraft, including 2,000 fighters.

²⁷Bueschel, *op. cit.*, p. 33.

and engine production facilities to assemble, and eventually produce from scratch, Soviet type aircraft. In 1954 they began assembling Yak-18 primary trainers and by 1956 were assembling MiG-17s from Soviet-supplied components in their Shenyang plant. Three years later, the Chinese were producing 25 Shenyang MiG-17s a month without importing Soviet components and were also building a Chinese version of the VK-1 engine to go with them.²⁸

In the summer and fall of 1957, the Soviets demonstrated their first ICBM and their first artificial satellite, Sputnik. Mao was impressed, felt that the Soviets now had the edge in strategic weapons, and he announced triumphantly that the East wind was now prevailing over the West wind. Khrushchev, however, fully aware that the first ICBM did not mean full equality with the US SAC, was far less confident about the direction of the wind. But Mao, either to test the Soviet willingness to provide nuclear cover for Chinese ventures or because he thought the Soviet acquisition of an ICBM would restrain the United States, began an assault on the Nationalist-held offshore islands in August 1958.

The Nationalists in 1958 were dug in on the Matsus, off the port of Foochow, and Quemoy, literally in the port of Amoy. The Nationalists also had US backing, bolstered by the so-called Formosa Resolution, passed by both houses of Congress in January 1955, which authorized the President to defend the offshore islands if he judged

²⁸Bueschel, *op. cit.*, p. 40.

an attack on them to be a threat to Taiwan. Thus Mao's threat to Quemoy was a testing of the US determination in backing the Nationalists as well as Soviet willingness to provide a nuclear shield for the PRC.²⁹

The US Seventh Fleet resolutely protected the Nationalist supply route into Quemoy and Dulles implied that the American forces might use more than conventional weapons if needed. But even more to the point, the Nationalist pilots, flying F-86F Sabres, clobbered their Red opponents in their MiG-17s. According to one account, the final tally in the Taiwan Straits crisis of 1958 was 31 MiG-17s destroyed to the Nationalist loss of only two Sabres, or a kill-ratio of 16:1.³⁰ And most of the damage was done before the Nationalist pilots got the SIDEWINDER AAM.

By September 6, Peking agreed to begin negotiations with the United States through the ambassadors in Poland. Khrushchev, once the danger of an all-out conflict had passed, began to bluster and to brandish his nukes--but Mao was not impressed. When the real crisis was on, between 23 August and 6 September, the silence from the Kremlin had been deafening. Mao realized that any nuclear cover for Chinese adventures would have to be provided by the Chinese themselves. In short, the PRC would have to go it alone along the path of nuclear development.

²⁹Kenneth R. Whiting, *The Chinese Communist Armed Forces*, Air University, Maxwell AFB, 1974, p. 61.

³⁰Bueschel, *op. cit.*, p. 55.

The 1958 Taiwan Strait crisis coincided with the launching of Mao's Great Leap Forward. He was dissatisfied with the rate of economic growth and also determined to get away from dependence upon the Soviets for economic and military aid. The PRC economy was now to be developed at breakneck speed through the exploitation of China's enormous manpower in lieu of expertise and outside economic assistance. Massive doses of propaganda would, in Mao's opinion, unleash the people's will and they would perform wonders in transforming the nation's economy. "Self-reliance" became the magic word and this included the PLA. It was no longer popular by 1958, nor safe by 1959, to advocate emulation of the Soviets in either economic or military matters, and it was even more dangerous to advocate placating the Russians to insure the flow of Soviet weapons. For advocating such a policy, the Minister of Defense, P'eng Teh-huai, was replaced by Lin Piao in September 1959, and Lin began immediately to push the Maoist "ascendency-of-man-over-weapons" line.

The "self-reliance" mania also applied to aircraft procurement--the Chinese would build their own. In 1959 Russian-built MiG-19s began arriving in China and, with Soviet assistance, the Chinese began to build the facilities to produce their version of the aircraft, the Shenyang MiG-19. The objective was to produce a truly indigenous Chinese aircraft--airframe, engine, and electronic components. Unfortunately for the Chinese the ideological friction between Mao and Khrushchev increased to the point where Nikita pulled

his technicians out of China in mid-1960. The Shenyang production lines for the MiG-19 were still unfinished when the Russian advisors tucked their blueprints under their arms and headed for home. It was not until 1961 that the first Shenyang MiG-19 came off the assembly line and it took four more years to produce the first hundred of them. But, by then, 1964, the Shenyang MiG-19 was no match for the latest US and Soviet Mach-2 aircraft.

In summary, during the 1950s the Soviets created a potential Frankenstein monster by providing the wherewithal to modernize the PLA. The growing estrangement between Moscow and Peking from 1956 on led to Mao's resentment over his dependency upon Soviet economic and military assistance and to Khrushchev's realization that further Soviet contributions toward modernizing the PLA could well be, to put it euphemistically, counterproductive. Thus the cessation of all Soviet help in mid-1960.

25. US-SOVIET RELATIONS (1959-64)

In 1959, when relations were deteriorating badly on the Sino-Soviet front, Khrushchev, in keeping with the time-honored Russian strategy of mending Western fences when trouble looms in the East, began to woo Eisenhower. He visited the United States in the autumn of 1959 and ended his tour with a stay at Camp David where he and President Eisenhower discussed, among other things, the Berlin issue. It was also agreed that a Summit meeting would be held in Paris in May 1960.

Nikita's avid pursuit of American-Soviet *detente* à la 1959 further

exacerbated Mao's irritation with Khrushchev and the latter got a cool reception when he flew to Peking to help celebrate the 10th anniversary of the founding of the PRC. In later years the Chinese were to claim that Khrushchev's "ticket" to Camp David was his abrogation of the 1957 Sino-Soviet treaty on "new technology for national defense," i.e. the Soviet commitment to provide the Chinese with more help in developing an atomic weapon.

But between the autumn of 1959 and the very early spring of 1960, Khrushchev realized that he had no hard commitment from Eisenhower in regard to Berlin. It looked as though he would go to Paris with a weak hand and return with an empty one. It was while he was mulling over this possibility that fate delivered Francis Gary Powers and his U-2 into Khrushchev's hands.

The United States had been troubled for some time by its inability to get hard intelligence on the Soviet air and missile capabilities. The decision to build an aircraft capable of overflying Russian territory with impunity coincided with the Soviet rejection of Eisenhower's "open skies" proposal at Geneva in July 1955. C. L. "Kelly" Johnson of Lockheed had begun work on the U-2 in December 1954 and it was ready for service in 1956. Very light, with wings twice the length of the fuselage, the aircraft could fly at 70,000 feet, thus putting it out of the range of Soviet interceptors. U-2 flights along the Soviet borders began in September 1956 and by November the U-2s were penetrating USSR airspace. Soon there were U-2 bases ringing the Soviet Union: Incirlik at Adana

in Turkey, Bodö in Norway, Giebelstadt in Germany, Atsugi in Japan, and Lahore and Peshawar in Pakistan. The Russians were aware of the overflights, but could do nothing about them between 1956 and early 1960, and the information being obtained was making it difficult for Khrushchev to sustain his bluff about missiles coming off the Soviet production lines like sausages. Finally, on 1 May 1960, Francis Gary Powers made his ill-fated flight from Peshawar with the intention of landing at Bodö in Norway, but was shot down by a SAM missile at 68,000 feet over Sverdlovsk. Powers, who was unable to trigger the destruct mechanism, landed safely, and Khrushchev had what he needed to wreck the Paris Summit: the remains of the U-2 and its pilot alive and talking. But the U-2 flights had demonstrated the limited capabilities of the Soviet air defenses, that the location and numbers of its missiles could not be concealed, and, that once revealed, the unhardened launching sites were vulnerable.

Although Khrushchev would have nothing more to do with Eisenhower, he did agree to meet with the new President, Kennedy, in June 1961 in Vienna. His hectoring attitude alarmed Kennedy and, apparently, Khrushchev misjudged the young President egregiously, enough so that he came up with an ultimatum on Berlin which in turn led Kennedy to call up the reserves and generally beef up the American military posture. The Soviets responded in kind and Soviet servicemen scheduled to be released in 1961 were retained on active duty. To make matters worse, in Khrushchev's view, the Americans had revised

their estimate of the Soviet-American ICBM balance and were trumpeting to the world that Russia was now low man on the totem pole.

Khrushchev, looking around for some way to redress the strategic balance and also enhance his sagging image as a diplomat, preferably through an inexpensive "quick fix," decided to use the newest addition to the "socialist camp," Cuba, as a base for Soviet MRBMs and IRBMs, as well as Il-28 light bombers. These weapons systems which lacked the legs to be effective while stationed in the Soviet Union, would be the equivalent of ICBMs and long-range aircraft if poised in Cuba, 90 miles from the American mainland.

Castro, who came to power at the very end of 1958, began, almost immediately, the expropriation of U.S. property and accompanied this action with an ever more venomous tirade of anti-American diatribes. The Soviets lost no time in cultivating Fidel--Mikoyan was in Havana as early as February 1960. Between July and November 1960, Cuba received some 30,000 tons of Soviet arms, including MiG-17 and -19 aircraft. Cuban-American tensions rose steadily, and in January 1961 President Eisenhower broke off relations with Cuba. His successor, John F. Kennedy, had hardly taken office in 1961 when the Bay of Pigs fiasco exacerbated relations still further. Castro responded by declaring Cuba a "socialist republic" in May and in December proclaimed himself a Marxist-Leninist. The Organization of American States, except for Mexico, voted to isolate Cuba in February 1962. In the spring of 1962, Soviet military aid was escalated and included 50 to 75 MiGs. Furthermore, Cuban pilots were now being

trained by the Soviets. Raúl Castro, the Cuban Minister of Defense, visited Marshal Malinovsky, his counterpart in the Soviet Union, and the arms shipments to Cuba speeded up, including SA-2 GUIDELINE missiles. By September there were several thousand Soviet military advisers and technicians in Cuba.³¹

On September 28, American intelligence reported that crated IL-28s were being shipped into Cuba. Senator Keating throughout September maintained that his own sources of information were reporting the Soviet build-up of intermediate-range missile sites in Cuba, but U-2 flights were unable to spot the sites. Finally, on October 14, Majors Anderson and Heyser photographed MRBM and IRBM launching sites in advanced stages of construction near San Cristóbal. Reconnaissance the next day revealed that missiles, covered by tarpaulins, were being hauled to the sites. President Kennedy, upon seeing the photographs, immediately set up an Executive Committee of the National Security Council to deal with the crisis. The Committee saw the US options as ranging from doing nothing, that is accepting the presence of the Soviet offensive missiles in Cuba as a *fait accompli*, to attacking Cuba, either in the form of an invasion or by destroying the missile sites in air strikes. The Committee also saw the Soviet Union, not Cuba, as the real danger. After a

³¹Estimates of the number of Russians in Cuba during the missile crisis vary considerably, Hanson Baldwin in his chapter "A Military Perspective," in John Plank (ed.), *Cuba and the United States*, Washington, Brookings Institution, 1967, p. 205, says there were thirty to forty thousand.

week of deliberations, it was decided to make the following responses simultaneously: institute a naval quarantine of Cuba to prevent further deliveries of offensive weapons, publicly expose the Soviet action, present the case to the OAS, and proceed with the total mobilization of the U.S. military forces.

On October 22nd President Kennedy described the situation to the nation on television and radio and also stated that any nuclear attack from Cuba would lead to retaliation upon the Soviet Union. The gauntlet was down and Khrushchev had only two options: to back down or to risk a nuclear war. In the meanwhile the United States was busy presenting its case far and wide: Acheson to the NATO powers, Rusk to the OAS, and Stevenson to the U.N. The mobilization, especially SAC and conventional forces in Florida, plus rumors that an invasion of Cuba was imminent, left Khrushchev with little time to react. On October 25 he wrote to Bertrand Russell stating that the Soviet Union was willing to deal with the Cuban crisis at a summit meeting and on the following day sent a letter to Kennedy in which he agreed in principle to remove the missiles. Some ten letters passed between the two during the next few days, the net result of which was the Soviet removal of the offensive missiles and Il-28s. By November 12th the Soviets had withdrawn all 42 missiles, begun the destruction of the launching sites, and in early December brought home over 40 Il-28s.

Khrushchev had lost prestige in the eyes of his marshals. They had been told by the new authority on strategy in 1960 that the

Soviet Union could afford to reduce its conventional forces because from now on intercontinental missiles with nuclear warheads were the new order of firepower and the decisive factor in the course and outcome of war. But when the chips were down in Cuba in October 1962, the Soviets had been forced to back down. In addition to being on the short end of the new order of firepower, the Soviets had neither the naval power nor the airlift to protect their installations in Cuba. Khrushchev's "minimum deterrence" fastened the Soviet Union with a single option--nuclear war. And that option had no credibility.

CHAPTER V

THE GREAT LEAP FORWARD (1965-1976)

The ousting of Nikita Khrushchev and the advent of the Brezhnev-Kosygin team to power in October 1964 were momentous events in the evolution of the Soviet Armed Forces in general and the Air Force in particular. On the whole, the new regime did not change the Khrushchevian objectives in foreign policy greatly, but it did strive to obtain the military wherewithal needed to implement them. Khrushchev, determined to expand Soviet influence throughout the world, had gone beyond Stalin's "continental strategy," a strategy concerned primarily with the defense of the Soviet Union and its satellites. But Khrushchev's ambitions outran Soviet capabilities as was so clearly demonstrated in the Cuban episode in October-November 1962. The new leaders opted for a rapid augmentation of the whole spectrum of Soviet military capability, strategic and tactical, nuclear and conventional. The name of the game was to be the ability to exert military pressure anywhere on the globe, a capability that had to be credible and obvious to all.

Over the next decade, a tremendous military build-up took place in the Soviet Union. ICBMs, nuclear-powered subs and SLEBs, new surface vessels, and improved types of aircraft poured out of the Soviet shipyards and plants. The new leaders showed their determination to acquire that military wallop so demonstrably lacking during Khrushchev's tenure. By the time the SALT I agreement was signed in

May 1972, the Soviets had more and bigger ICBMs than did the United States, although the US lead in MIRV technology meant that it could put more warheads on target. Over the next four years the Soviets pulled ahead of the United States in the number of nuclear-powered subs, in the range of their SLBMs, and Admiral Gorshkov came to preside over a "blue-water navy" capable of operating in any corner of the globe. There could be little doubt by 1976 that the Soviets had the weapons systems to back up their global pretentions.

26. AIRCRAFT AND ANTI-AIRCRAFT DEVELOPMENTS (1964-76)

Four new planes appeared at Tushino during the 1956 Air Show, all apparently designed to replace the MiG-19 in the role of a strike aircraft. Two of the planes were from the Mikoyan OKB, a swept-wing job, the FACEPLATE, and a delta-wing aircraft, the prototype of the MiG-21 FISHBED, which became the standard aircraft of Frontal Aviation in the 1960s and early 1970s. The other two came from the Sukhoi OKB: the Su-7 FITTER-A, a swept-wing, single-engine plane that became the standard tactical fighter-bomber of Frontal Aviation, and the Su-9 FISHPOT-B, a delta-wing, single-engine all-weather interceptor which became a mainstay of IA/PVO *Strany*.

In 1967 there appeared a much improved development of the Su-9, the Su-11 FISHPOT-C. Its upgraded Lyulka AL-7F engine gave it a top speed of Mach 1.8 at 40,000 ft. According to Jane's *All the World's Aircraft 1974-75* (p. 510): "In 1974, the Su-9 and Su-11 continued to form 25 per cent of the Soviet defense interceptor force."

The follow-on to the Su-11 was the Su-15 FLAGON, a twin-engine

(Lyulka AL-7F-3), delta-wing interceptor, first flown in prototype in 1965 and in service with IA/PVO *Strany* by 1969. It has a top speed of Mach 2.5 and carries two ANAB air-to-air missiles. In 1974 the Su-15 was numerically the most important all-weather interceptor in the PVO.¹

The Sukhoi OKB demonstrated a marvelous ability to keep the costs of new aircraft down when it redesigned the Su-7 by installing variable-geometry wings, putting in a more powerful engine, and increasing the fuel-load. The new plane, the Su-17/20 FITTER-C, has a top speed of better than Mach 2 at high altitude and a combat radius of just under 400 miles.² As Green and Swanborough point out, the Su-20 is "unique among current service combat aircraft in being a variable-geometry derivative of an existing fixed-geometry aircraft."³ The Su-20 was used successfully by the Indians to deliver one-ton bombs in the war with Pakistan. According to Panyalev, "the Soviet practice of continued development of their aircraft in order to keep them in service [as in the case of the FITTER and the FISHBED, KRW] for 30 or 40 years."⁴ This practice allows long-term standardization within the Warsaw Pact countries and also the use of the same

¹Green, William and Gordon Swanborough, *The Observer's Soviet Aircraft Directory*, New York, Frederick Warne, 1975, p. 208.

²Georgiy Panyalev, "Sukhoi's Swing-Wing SU-17/20 FITTER C," *Interavia*, June 1976, pp. 557-558. Panyalov claims that the confusion in the numerical part of the designation is because the Su-17 is the Soviet model and the Su-20 the export version.

³*Op. cit.*, p. 210.

⁴*Loc. cit.*, p. 169

production facilities over a long period of time reduces costs.

The latest product of the Sukhoi design bureau is the Su-19 FENCER, a multirole combat aircraft. This plane can be used as a heavy fighter-bomber, an interceptor, or a reconnaissance vehicle. According to Panyalev, the Su-19 is a hybrid between the US F-111 and the MiG-23 FLOGGER. It is a two-seat, twin-engine, variable-geometry, swept-wing aircraft and its two AL-21F-3 engines give it a top speed at high altitude of Mach 2.4. It can carry a maximum weapon load of over 15,000 lbs. and it is the first Soviet fighter with an air refueling capability. The IL-76 tanker can refuel three Su-19s simultaneously.⁵

The Mikoyan OKB produced two follow-ons for the MiG-21, the MiG-23 FLOGGER and the MiG-25 FOXBAT. The MiG-25, under the designation of E-266, was setting speed records as early as 1965. It, like the MiG-23, was first displayed in 1967. It is a twin-engine, all-weather, cropped delta-wing interceptor and reconnaissance plane. The two huge rectangular intake boxes on both sides of the fuselage and the twin-tail fins makes the FOXBAT easy to identify. Its two Tumansky turbojets rated at 24,000 lbs. each gives the MiG-25 a top speed of Mach 3.2 at high altitude. It has a service ceiling of 80,000 ft. and a combat radius of 700 miles.

The MiG-23 FLOGGER, which came into service in 1971 or 1972, is now widely used by Frontal Aviation. It is a single-seat,

⁵G. Panyalev, "The Sukhoi SU-19 FENCER--threat to Western Europe," *International Defense Review*, January 1976, pp. 67-69.

variable-geometry-wing tactical fighter. Its 20,000 lb. thrust turbojet can push it along at Mach 2.3 at high altitude and it has a combat radius of 600 miles. According to IISS's *Military Balance 1975-1976* (p. 10), Frontal Aviation now has 400 MiG-23s in service.

The Yakovlev OKB's Yak-25 FLASHLIGHT of the early 1950s was followed by the relatively unsuccessful Yak-27R MANGROVE reconnaissance plane and then by the Yak-28 BREWER, a third generation derivative of the Yak-25. It came into service in 1964 as a strike aircraft. It is a twin-engine, swept-wing plane with a top speed of Mach 1.5 at 40,000 ft. and has a tactical radius of 200 to 300 miles depending upon altitude and load.

Developed simultaneously with the Yak-28 BREWER, the Yak-28P FIREBAR is an all-weather interceptor which has been a work horse in IA/PVO *Strany* for more than a decade. It carries a pair of ANAB air-to-air missiles.

In the bomber category, the Soviets have depended mainly upon their old war-horses the BADGER, BEAR, and BISON to fulfil the strategic role in their Long-Range Air Force. In 1964-65, the Tupolev Tu-22 BLINDER medium-bomber came into service. This is a twin-engine, swept-wing bomber with a top speed of Mach 1.5 at 40,000 ft. and a maximum unrefueled range of 1,400 miles. One version carries a KITCHEN air-to-surface missile with a range of 460 miles. By late 1974 the Tu-22 was displacing the Tu-28P FIDDLER as a long-range interceptor.

In 1969 there were hints about a new Soviet bomber and in 1970 its

existence was confirmed. The first deliveries to the Soviet Long-Range Air Force came in 1974 and the new bomber was given the NATO code name of BACKFIRE. (One guess is that its Soviet designation is (Tu-26)) The BACKFIRE is over twice as heavy as the US F-111 and one-third lighter than the US B-1. Its two Kuznetsov NK-144 tubofans have higher thrust than these of the Tu-144 supersonic transport and are estimated to push the BACKFIRE along at Mach +2. It has variable-geometry wings. According to some observers, including General George Brown, chairman of the Joint Chiefs, the BACKFIRE, with light refueling, could operate subsonically from Arctic bases and hit almost any point in the United States and return to base.⁶ The BACKFIRE has a tail-mounted radar-controlled 37mm cannon, can carry up to 18,000 lbs. of bombs in its bomb bay and two AS-6 air-to-surface missiles under its wings. The recently developed IL-76 tanker makes in-flight refueling of the BACKFIRE feasible. This bomber has become a source of controversy in the SALT II talks: the United States negotiators want to class it as a strategic bomber and Soviets deny that it has that capability.

Postwar helicopter development in the Soviet Union was dominated for years by the designs of Mikhail L. Mil' (died in 1970). He established the Mil' OKB in 1947 and in 1949 the Mil' Mi-1 HARE went into production. The Mi-1 was a conventional helicopter with a single three-blade rotor and an anti-torque rotor. It was powered

⁶G. Panyalev, "Backfire--Soviet counter to the American B-1," *International Defense Review*, May 1975, p. 639.

by an Ivchenko AL-26V piston engine which gave it a speed of 105 mph and it carried a pilot and two passengers. Over the years the Mi-1 has been used for many roles including an ambulance version, a forestry patrol craft, and even as a whale-spotter with the fishing fleet. It has been exported to just about every satellite and client-state country.

The Mi-4 HOUND was publicly demonstrated in 1953, although it was in production as early as 1952. The military version has two pilots and can carry up to a dozen fully-equipped soldiers or 3,500 lbs. of cargo. Eventually a close-support model with a front-mounted gun and air-to-surface rocket pylons was produced. The Mi-4 is also used by the Navy for ASW work. Powered by an Ash-82V radial engine with 1,700 hp, it has a top speed of 130 mph and a maximum range of 370 miles. The Mi-4 has been produced in large quantities, more than any other Soviet helicopter, and has been exported, both civil and military versions, to all satellite and most Soviet client states.

The Mi-2 HOPLITE, certified in 1963, is a turbine-engine helicopter, powered by two 435 shaft horsepower Isotov engines; its top speed is 130 mph and its maximum range is 360 miles. Although the prototype was built in the USSR, since 1964 the machine has been produced in Poland. It is a general purpose vehicle which carries 8 passengers or 1,500 lbs. of cargo.

The Mi-6 HOOK is a large machine powered by two Soloviev 5,500 shaft horsepower turboshaft engines which give it a top speed of

186 mph. The HOOK can lift up to 10 tons and a maximum range of 900 miles. It was developed in the late 1950's "to complement the Antonov An-12 transport with the ability to ferry to the front line many items of equipment that could be transported in that aircraft."⁷ Over 500 of them have been built, mostly going into service with the VVS.

By early 1974 over a thousand Mi-8 HIP helicopters had been built as the follow-on for the HOOK. First appearing in 1961, it went into production several years later. The Mi-8 has two 1,500 shaft horsepower Isotov turboshaft engines which give it a top speed of 137 mph and a capability to lift over four tons. The military version has gun pods and can carry air-to-surface missiles. Many satellite and client-state air forces now have Mi-8s. The Mi-10 HARKE is a variant of the Mi-6, but is designed to carry awkward and outsize loads under the fuselage. It can carry up to 28 passengers.

The first specially designed helicopter gunship and assault transport in the VVS was the Mi-24 HIND which first appeared in large numbers with the Group of Soviet Forces in East Germany in 1973. A follow-on development of the Mi-8, it has the same Isotov engines. It is armored for crew protection, has a 12.7mm gun, and one version, the HIND-A, has rocket pods and can carry two SWATTER wire-guided anti-tank missiles.

In addition, Nikolay I. Kamov produced in the early 1960s a

⁷Green and Swanborough, *op. cit.*, p. 188.

turbine-powered ASW helicopter, the Ka-25 HORMONE. The Ka-25 became the standard vehicle aboard the helicopter carriers, the *Moskva* and the *Leningrad*, and serves as the on-board ASW vehicle on a number of other ships. Powered by two Glushenkov turboshaft engines, the Ka-25 has a top speed of 137 mph, a range of 250 miles, and carries submarine detection gear and depth charges.⁸

At the Air Show at the Domodedovo Airport in July 1967, the last such show to date, two STOL aircraft were displayed: the Mikoyan FAITHLESS, a special version of the MiG-21 with two lift engines as well as the main power plant, and the FLAGON-B, a Sukhoi-designed STOL aircraft with three direct-life engines. At that same show the Yak-36 FREEHAND was first displayed, a twin-turbojet V/STOL plane. This plane will probably be used as the fixed-wing aircraft on the new aircraft carrier, the *Kiev*, which entered the Mediterranean on 19 July 1976. The *Kiev* does not have the catapults nor the arresting gear to utilize non-V/STOL aircraft.⁹

Modern aircraft, flying at highsonic and supersonic speeds, can no longer depend upon machine guns and cannon to down enemy aircraft or to hit ground targets with sufficient destructive power. The newer types of aircraft have come to depend upon air-to-air

⁸Information about the helicopters mainly obtained from Green and Swanborough, Jane's *All the World's Aircraft*, and Jean Alexander, *Russian Aircraft Since 1940*.

⁹Norman Polmar, "Soviet Naval Aviation," *Air Force Magazine*, March 1976, pp. 69-75.

missiles (AAMs) and air-to-surface missiles (ASMs).

As mentioned in Chapter IV, the first Soviet AAM, the ALKALI, appeared in the middle 1950s, and the ANAB in 1961, followed by the ASH a little later. Then came the ATOLL, which closely resembles the US SIDEWINDER. It is powered with a solid propellant, has an infra-red homing system and a three to four mile range. [A Swedish Air Force officer, Colonel Wennerstrom, was accused of passing information about the SIDEWINDER to the Soviets and in 1967 Soviet agents stole a SIDEWINDER in West Germany.] The MiG-21 FISHBED-D carried two ATOLLS and this system got a workout in the Indo-Pakistan War of 1971 and the Yom Kippur War of 1973. The Egyptian MiG-21 pilots complained of trouble in getting the ATOLL¹⁰ to lock onto target.

The main Soviet ASMs are the AS-2 KIPPER, the AS-3 KANGAROO, the AS-4 KITCHEN, and the AS-6. The AS-2 is a standoff missile, first seen in 1961, with a turbojet propulsion and a range of about 185 miles. In general appearance it resembles the US HOUND DOG. It is the standard anti-shiping missile carried by the Tu-16 BADGER.

The AS-3 KANGAROO, also first seen in 1961, is a much larger missile than the AS-2 and is carried by the Tu-95 BEAR as a weapon for area targets such as cities. It probably has a turbojet propulsion system and its range is a matter of conjecture, with estimates varying from 120 to 400 miles.

¹⁰ *Both Sides of the Suez*, p. 9.

The AS-4 KITCHEN, with dimensions in between the AS-2 and the AS-3, about 36 feet long [KANGAROO=49 ft. and KIPPER=31 ft.], is much more technologically advanced than its two predecessors. It is powered by a liquid-fueled rocket and has a range somewhere between 200 and 500 miles, depending upon whose estimate is used. The Tu-22 BLINDER equipped with the AS-4 was first seen in 1967.

The AS-6, apparently designed for the BACKFIRE, is about 30 ft. long, has a solid fuel rocket motor, and a top speed of Mach 2.5 at high altitude. The missile also has a range of about 160 miles at sea level and can carry a 700-lb. nuclear warhead.

In the surface-to-air (SA) category of missiles, the Soviets have some ten different weapon systems ranging from the SA-1 GUILD, first seen in 1960, to the SA-8, which appeared in the November 1975 Red Square march-by. The sequence of SA-9, SA-10, and SA-8 is a bit confused at the present time.

SA-1 GUILD, a 40-ft. solid-propellant missile is probably nearing obsolescence in the USSR and it has never been shipped abroad. The SA-2 GUIDELINE is a medium-range anti-aircraft missile made famous in Vietnam and in the Middle East. It is radio-controlled and guided by a moveable tail; it has a two-stage propulsion system and a slant range of 25 to 30 miles. The ceiling is around 60,000 ft. and the missile is used in conjunction with a FAN SONG radar.

The SA-3 GOA is used by both PVO and the Navy. It is designed for short-range defense against low-flying aircraft, is very mobile,

and is used in conjunction with the LOW BLOW radar. Probably a command-guided missile and it has a range of 15 to 18 miles.

The SA-4 GANEF, first seen in 1964, can be launched from a tracked vehicle which carries two missiles. It has solid-propellant boosters and a ramjet sustainer, is used in conjunction with a PAT HAND radar, and has a range of about 40 to 45 miles. It is widely deployed in the USSR and was used in the Yom Kippur War in 1973.

The big surprise in the Yom Kippur War, however, was the SA-6 GAINFUL, first seen in Moscow in 1967. It has both command and homing guidance, is fully mobile on a tracked launcher, and is accompanied by a separate vehicle which carries its acquisition and fire-control radar equipment. Since the SA-6 has an effective minimum capability as low as 150 ft. with optical tracking, it was able to raise hob with the Israeli planes in the early period of the war.

For the maximum in mobility and simplicity, the SA-7 STRELLA shoulder-launched or multiple launchers on a vehicle fits the bill. The SA-7, it would seem, has a definite future in guerrilla wars.

Little is known about the SA-9 and SA-10, but the SA-8, demonstrated in the November 1975 Red Square parade, seems destined to be produced in large numbers. To quote one source, it "fills the gaps in the existing combat zone air defenses between the ZSU-23 mobile radar controlled quad gun mount, the IR-guided SA-7 and SA-9 missile systems and the SA-6 medium range anti-aircraft missile system."¹¹ In size and weight the SA-8 resembles the US SEA SPARROW

¹¹ *International Defense Review*, No. 6 (December 1975), p. 805.

and it has a range of between 6 and 10 miles. There is some suspicion that the SA-8 may be the Army version of the Navy's SA-N-4 already in service.

Finally, to fill in any gaps left by missile coverage, there is the SHILKA ZSU-23mm anti-aircraft weapon. The package consists of a tracked vehicle which mounts four 23mm cannon which fire together. The vehicle also carries its own radar and optical guidance systems. The SHILKAs proved effective against Israeli-piloted F-4 Phantoms and A-4 Skyhawks in the Yom Kippur War in 1973.

All in all, the Soviet SAMs and AA artillery are both qualitatively sophisticated and quantitatively multitudinous. According to the International Institute for Strategic Studies, PVO has 12,000 launchers at about 1,650 sites, about one-third of them SA-2 GUIDELINES and the rest ranging from SA-1s to SA-6s.¹² This array of SAMs and anti-aircraft artillery is supplemented by over 2,500 interceptors assigned to PVO. It is an impressive air defense system.

27. SOVIET INVOLVEMENT IN THE MIDDLE EAST (1965-76)

Soviet military aid to Egypt continued under the Brezhnev-Kosygin regime and enabled Nasser to intervene in the civil war in Yemen. By early 1967, the Egyptian Air Force possessed a sizeable inventory of excellent Soviet aircraft, an inventory that included

¹²*The Military Balance 1975-1976*, p. 8.

125 MiG-21s, 80 MiG-19s, and 110 MiG-17s and -15s. In addition, the Egyptians had 40 IL-28 light bombers and 30 Tu-16 medium bombers. The Syrians had 36 MiG-21s and 40 MiG-17s and -15s, while Iraq had 48 MiG-21s, 12 MiG-19s,¹³ and 80 MiG-17s and -15s, plus a few IL-28s and Tu-16s. The Soviet largesse had been generous indeed in the Middle East.

The Israeli Air Force looked rather lean when compared to its Arab opponents. The 72 Mirage IIICs were able to face the MiG-21s as were the 18 Super Mysteres. The other 150 aircraft were subsonic and in some cases obsolete.¹⁴ The Israelis, however, were well acquainted with the MiG-21. A defecting Iraqi pilot had flown his MiG-21 to Israel in August 1966 and it was used in mock battles with the Mirages to sharpen the Israeli fliers.

The Israeli strategy in any future war, because of the short warning time in Arab air attacks, called for the elimination of the Egyptian Air Force on the ground at the very outset of the war. Because of the limitations of the Mirages in weapons payloads, it would be necessary for each plane to fly several sorties with a minimum turn-around time at home base. The plan was a high risk venture in that it involved all but one squadron of the Israeli fighters and if the Egyptians did succeed in getting some of their bombers over Israel, there would be little to hinder them.

¹³ Luttwak, Edward, and Dan Horowitz, *The Israeli Army*, New York, Harper & Row, 1975, p. 222.

¹⁴ *Ibid.*, p. 218.

The Israelis insisted that the French put guns on the Mirages in addition to missiles--they felt that well-trained pilots could still use guns effectively even in supersonic aircraft. The pilots were also taught to fight in pairs, to maneuver the opponent into dog-fights, and to use guns as well as missiles in air-to-air combat. So rugged was the training that there was a 90 percent dropout rate. But the fliers in their Mirages and Super Mysteres were a select lot and they were to prove it in June 1967.¹⁵

In May 1967, the Soviets deliberately increased Arab-Israeli tensions by charging that Israel was about to invade Syria. Nasser, smarting under Syrian accusations that he was dragging his feet in the liberation of Palestine, demanded the withdrawal of the UN Emergency Force in the Sinai, a demand that U Thant complied with in unseemingly haste. At this point Nasser instituted a blockade off the Gulf of Aqaba, thus cutting off Israeli shipping.

At 0745 on 5 July 1967, the first wave of Israeli planes hit nine Egyptian airfields and ten minutes later the second wave struck. From then on the waves came at ten-minute intervals as the Israeli aircraft re-loaded and re-fueled in minutes. By 1050 the backbone of the Egyptian Air Force, the MiG-21s, no longer existed. In the afternoon the Israeli pilots went after the Syrian MiG-21s and the Hunter squadrons in Jordan. All told, in the Six Day War (5 to 10 June), the Arabs lost 452 aircraft, most of them on the ground in the first day.¹⁶

¹⁵ *Ibid.*, pp. 197-201.

¹⁶ *Ibid.*, pp. 225-230.

From the end of the June War to the fall of 1968, Nasser worked assiduously with generous Soviet help to rebuild his shattered military forces. By September 1968 the Egyptians apparently felt strong enough to begin an intensive shelling of the Israeli line along the Suez Canal. The Israelis responded with helicopter-lifted commando raids deep into Egypt. The Egyptians were quieted and the Israelis proceeded to build the Bar Lev Line along the Canal.

In March 1969, however, the Egyptians were at it again with their artillery and Nasser stated that a "War of Attrition" was under way. By July the Israeli losses were severe enough to engender Israeli air strikes across the Canal and by December the Egyptian artillery and missile sites were largely eliminated. At that point the Israelis began deep penetration raids, utilizing their newly acquired F-4 Phantoms. Some of the strikes were in the very suburbs of Cairo. Nasser, in desperation, again called upon the Russians to bail him out.

Between March and June 1970, the Soviets contributed a whole air-defense package and even the experts to man it. They shipped in 150 MiG-21Js with around 300 pilots, some 80 SA-3 GOA missile launchers and 160 missiles, new low-level radar equipment, and a large number of ZSU-23mm SHILKA quad-mounted mobile radar-directed cannon. By the end of June the air defense along the Egyptian side of the canal consisted of improved SA-2 GUIDELINE missiles for high altitude interception, SA-3 GOA missiles for low-level

interception, and over a thousand ZSU-23mm SHILKAs.

Secretary of State Rogers began to negotiate with both sides in an attempt to prevent another Arab-Israeli war and on 7 August 1970 he got both sides to agree upon an armistice. But the Soviet-Egyptian group took advantage of the "Roger's Cease-Fire" to move a couple of dozen SA-2 and dozen SA-3 batteries into the "stand-still zone," a flagrant violation of the agreement. Incidentally, on 30 July 1970, just prior to the "Roger's Cease-Fire," Israeli pilots shot down four Russian-piloted MiG-21Js. Marshal P.S. Kutakhov, C-in-C of the VVS, was reported to have flown in to Cairo the next day to find out why his pilots had done so badly against the Israeli fighter jockeys.¹⁷

For the next three years the Israelis built up their air force largely with US aircraft, some one hundred F-4 Phantoms and 125 A-4 Skyhawks to go with their Mirage IIICs and Super Mysteres for a total of over 400 planes.¹⁸ During that same period the Egyptians, although ridding themselves of the Russians in mid-1972, built an air defense system based on Soviet weapon systems.

On 6 October 1973, Yom Kippur, Egypt and Syria hit Israel along the Suez Canal and in the Golan Heights. Through a failure in intelligence, the Israelis were caught partially unprepared and to some extent the beginning of the Yom Kippur War was a reverse image

¹⁷*Ibid.*, pp. 325-26.

¹⁸Institute for Strategic Studies, *Military Balance for 1972-1975*.

of the June War in 1967--the Israelis being the stricken ones this time. The Israeli aircraft, hitherto a decisive factor in conflicts with the Arabs, ran into deep trouble both in the Suez Canal area and on the Golan Heights. A close-knit array of overlapping SA-2, SA-3, and SA-6 missile batteries plus SA-7s and ZSU-23mm SHILKAs cost the intruding Israeli pilots dearly. Simultaneously, the Egyptians crossed the Canal and when the Israeli tanks charged them, they picked them off with either their RPG-7 (Rocket-Propelled Grenade) bazookas or with their wire-guided anti-tank missiles, the SAGGERS. The net effect was the neutralization of the two chief weapons systems in the Israeli arsenal: the fighter-bomber and the tank.¹⁹

This round in the Israeli-Arab duel lasted three weeks instead of six days. The Arabs gained considerable stature, offsetting to some extent the loss of prestige engendered by their miserable performance in June 1967. But the main lesson of the Yom Kippur War was the effectiveness of the Soviet-built defensive weapons. The combination of accurate anti-tank and anti-aircraft missiles was not only an eye-opener for the Israelis, but also for other armies wedded to the superiority of the *offensive* over the *defensive*.

¹⁹ For further details see: *The Yom Kippur War* (By the Insight Team of the London *Sunday Times*), New York, Doubleday, 1974, *passim*; Martin van Creveld, *Military Lessons of the Yom Kippur War*, Beverly Hills, Calif., Sage Publications, 1975; *Both Sides of the Suez* (*Aviation Week and Space Digest* articles), McGraw-Hill, no date.

The fierceness of the conflict resulted in a voracious gobbling up of tanks, planes, missiles and ammunition. By 9 October the Soviets began airlifting missiles to Egypt and Syria, shortly followed by more MiG-21s and tanks were soon going to Syria by ship. The United States airlift of war supplies to Israel did not begin until 14 October, and high time since the Israelis were down to a two-day supply of tank ammunition. The Soviet AN-12s and AN-22s and the US C-5As hustled their cargoes to the warring sides, a vivid demonstration of the role of airlift on a global scale.

By the end of the first week the Syrians were in serious trouble and were appealing to their Egyptian ally for help. On 14 October the Egyptians launched a thousand-tank offensive along the Canal, but it was a disaster. On the night of 15-16 October an Israeli division got across the Canal and fanned out behind the Egyptians. The Egyptians, because of poor communications, did not realize the seriousness of their position until 18 October. It was only when the Israeli armored forces began to tear up anti-aircraft missile installations and make it possible for the Israeli fighter-bombers to operate effectively in the Canal zone that the Egyptians became aware of their predicament. The 600-plane Egyptian Air Force, in trying to stop the Israeli air attacks, took its traditional shellacking.

At this point the Egyptians had to urge the Russians to get them a UN cease-fire, which after some blustering by Moscow, came about on 25 October and the Yom Kippur War was over. But both sides paid

dearly. The Israelis lost 2,500 men, 800 tanks, and 115 aircraft. It cost the Arabs 16,000 dead, 450 planes, and 2,000 tanks.²⁰

28. THE SINO-SOVIET SPLIT DEEPENS

Although the ousting of Khrushchev brought hopes for a mending of the split between Peking and Moscow, the respite was short-lived. By November 1964 the Chinese were designating new leadership in the Kremlin as "Khrushchevism without Khrushchev" and reviling it vigorously.²¹ Kosygin's success as a peacemaker between Pakistan and India at Tashkent in January 1966 infuriated the Chinese still more as they maintained that he had favored the Indian "aggressors" at the expense of Peking's Pakistani friends. Furthermore, the Soviets and the Chinese were butting heads in the Third World in general and in Africa in particular in the 1960s. The Great Proletarian Cultural Revolution that raged in China between 1965 and 1969 did nothing to soften that country's relations with the Soviet Union--actually, the Cultural Revolution saw Chinese xenophobia run rampant, especially toward the "Soviet Revisionists." By January 1967 the *People's Daily* (Jen-min Jih-pao) was referring to the leadership in Moscow as a "handful of filthy Soviet revisionist swine!"

The growing bitterness that marked the Moscow-Peking dialogue caused the Soviets to increase their military forces along the

²⁰*The Yom Kippur War*, p. 450.

²¹*Peking Review*, Vol. VII, No. 48 (27 November 1964), pp. 6-9.

Chinese border and this in turn led to a multitude of minor skirmishes between Russian and Chinese patrols. Finally, on 2 March 1969, the Chinese bushwacked a Soviet patrol on Damansky (Chen Pao) Island, a barren bit of land lying in the Ussuri River. The Soviets suffered severe losses. On 15 March, the Soviets hit back and it was the Chinese turn to lick their wounds.²² It looked for a while as though the Sino-Soviet dispute was going to escalate into an all-out war.

Alarmed by the open hostilities on the Ussuri, the Soviets accelerated their military build-up in the Far East and today the Soviets have, according to the Chinese, a million-man army in that area. Another, and less biased source, puts the Soviet forces on the Chinese border at 43 divisions, seven of them tank divisions. These troops are supported by some 900 aircraft, a large number of mobile missiles, and a more than adequate air defense system.²³

It would seem the acme of foolhardiness for the Chinese People's Liberation Army to take on this formidable array of Soviet military strength. The PLA's 55 divisions in the Peking and Shenyang (Manchurian) Military Regions can match the Soviets in raw manpower, but would not be in the same ball park when it came to weaponry. The Chinese probably have fewer than a hundred first-line fighters (MiG-21s and F-9s), while the bulk of their air force is made up of

²²K. R. Whiting, *Evolution of the Sino-Soviet Split: A Summary Account*, Air University, 1975, pp. 75-81.

²³*Military Balance 1975-1976*, p. 9.

some 3,000 MiG-15s, -17s, and -19s. The PLA's strategic wallop is confined to 70 or 80 IRBMs and MRBMs plus 60 Tu-16s, i.e. some 140 vehicles capable of putting nuclear warheads on target.²⁴ This is a very unimpressive inventory when compared to the Soviet arsenal of MiG-23s, MiG-25s, Su-19s, and BACKFIRES, the Soviet missiles capable of delivering a rather copious number of nuclear warheads, and the Soviet air defense with its impressive array of SAMs and AA artillery.

Although probably awed by the Soviet military might, or least made cautious by it, the Chinese have gone right on with their insults, insults that verge at times on pure billingsgate. There seems little chance of a revival of the "Sino-Soviet Bloc" that so impressed the West in the 1950s, but even after Mao dies, an event that cannot be too far away, the best that the Soviets can hope for is a truce, an armistice, in the vituperation emanating from Peking.

29. SOVIET POLICIES IN SOUTH AND SOUTHEAST ASIA

During Khrushchev's tour of duty in the late 1950s and early 1960s, Soviet relations with India grew somewhat closer, especially as the two powers found a common enemy in the People's Republic of China, but Soviet interest in the Southeast Asian situation remained marginal. It was not until the Brezhnev-Kosygin team came to power that the Soviets began to play a key role in the war in Vietnam.

²⁴*Ibid.*, pp. 49-50.

Soviet-Indian Relations: Following the Soviet good offices at Tashkent in January 1966, relations with India prospered. For besides their common enmity for China, New Delhi was also worried by Peking's tilt toward Pakistan. Any future war with Pakistan would present India with a severe problem if the Chinese were to intervene, or even threaten to intervene, in the northeast area adjacent to East Pakistan. Such a move would force the Indians to divide their forces. But Soviet pressure on China could be a guarantee against such a threat. Furthermore, the advent of Indira Gandhi to power in early 1966 helped to warm up Indo-Soviet relations since she tended to be pro-Soviet by philosophical inclination. The dialogue between New Delhi and Moscow continued somewhat fitfully, but by 1969 India had received some 600 tanks, 140 guns, two submarines and a destroyer, 260 fighter aircraft (Mig-21s and Su-7s), over 150 transport aircraft, and 50 SAMs.²⁵ In addition, Indian trade with the Soviet-satellite bloc had tripled between 1960 and 1969, partly because the Communists were willing to deal in rupees.²⁶ Then came the rapid worsening of relations with West Pakistan in 1971, a situation so bad that it made the Russian blandishments irresistible.

The Bengalis of East Pakistan had been restive under the rule of the predominantly West Pakistani government in Islamabad. In December 1970, the Awami League of East Pakistan, under the leadership

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Military Balance 1969-1970.

²⁶Bimal Prasad, *Indo-Soviet Relations, 1947-1972*, New Delhi, Allied Publishers, 1973, p. 333.

of Sheikh Mujibur Rahman, got a majority of seats in the general elections and it looked as though Sheikh Mujib and his Awami party would control the legislature in Islamabad. But on 25 March 1971 the military governor of East Pakistan unleashed his troops, mostly from the west, and a reign of terror ensued. In the next few months some nine to ten million Bengalis sought refuge in India. Furthermore, an "insurgency" or "liberation" force (depending on who is doing the telling), the Mukhti Bahini, mushroomed into an army of over a hundred thousand and a civil war was under way.

At this point, with the PRC and the United States tilted toward the West Pakistan side, New Delhi and Moscow proceeded to legalize their relationship. As Bimal Prasad, who is inclined to see only good emanating from Moscow, puts it:

The Government of India, under the courageous and wise leadership of Indira Gandhi, decided that, for safeguarding India's security and peace in the sub-continent in the prevailing circumstances, it was desirable to forge still closer ties with the Soviet Union. The talks going on fitfully since 1969 were, therefore, soon completed. . . .²⁷

The Treaty of Peace, Friendship and Cooperation was signed on 9 August 1971.

The heart of the treaty was contained in Articles VIII, IX, and X, which dealt with defense and security. In Article VIII each of the powers agreed to abstain from any military alliance directed against the other and to prevent the use of its territory for any act detrimental to the other party. Article IX bound either party

²⁷*Ibid.*, p. 378.

not to provide assistance to a third party in armed conflict with the other party, and in the event of hostilities, both parties should enter into mutual consultations to secure the peace and security of their countries. And in Article X, each promised not to enter into any obligation with one or more other states which may be incompatible with the treaty.²⁸

Draped in the treaty, India was able to ignore warning growls from China and proceeded toward a solution of the East Pakistan affair. On 3 December 1971, the Indians hit the Pakistani forces isolated in the eastern wing of the nation and two weeks later, on 16 December, the Pakistani army in Dacca surrendered. With the blessings of India and the Soviet Union, a new state was born, the People's Republic of Bangladesh.

Soviet-Indian relations have remained close since 1971. Mrs. Gandhi remains suspicious of US intentions, frequently blames her troubles on the machinations of the CIA, and makes regular pilgrimages to Moscow. About half the Indian Air Force planes and helicopters are either Soviet-built or Soviet types produced in India under license. For example, some 220 interceptors are MiG-21s. As long as the Soviets are interested in bolstering their strategic posture in the Indian Ocean, so long as they face a hostile China, just so long will they make every effort to keep India pro-Soviet.

²⁸The treaty is reproduced *in toto* in Prasad, *op. cit.*, pp. 391-94.

Southeast Asia: Khrushchev was never very enthusiastic about becoming deeply involved in the Indochinese embroglio, although he was quite generous in military and economic aid to Sukarno of Indonesia. In the final months of the Eisenhower presidency and first two years of the Kennedy administration, Khrushchev did intervene in Laos by supplying indigenous communist forces with military equipment by means of Soviet-piloted IL-14 transports. But it was a half-hearted effort and it petered out in the course of negotiations at Geneva in late 1961 and 1962. The main support for the North Vietnamese prior to 1965 came from the Chinese.

Khrushchev had been scarcely overthrown, however, before the new regime in the Kremlin reversed his Southeast Asian policy. Kosygin was sent to Hanoi with a large staff of military and economic advisors. He arrived there on 6 February 1965 and on 7 February US bombers hit the North Vietnamese barracks at Dong Hoi in retaliation for a Vietcong mortar attack on US personnel at Pleiku. From then on Hanoi was the recipient of generous military and economic assistance from *both* Peking and Moscow in spite of the growing Sino-Soviet estrangement.

Hanoi's main requirement from 1965 on was an effective air defense system to fend off the increasing US air attacks. When US planes attacked the North Vietnamese patrol-boat bases on 5 August 1964 in retaliation for the torpedo attack on the USS *Maddox* in the Tonkin Gulf, the North Vietnamese entire air defense consisted of 20 radar sets and 700 conventional anti-aircraft guns. Two days

later they got 30 MiG-15 and -17 aircraft from the Chinese.²⁹ On 5 April 1965, US pilots spotted the first SAM site (SA-2) and by the end of the year more than 60 SAM sites were located around the Hanoi-Haiphong area.³⁰ Although US pilots could evade most of the SA-2 missiles by flying low, below the 1,500-ft. minimum effective altitude of the SA-2, such a tactic exposed them to conventional anti-aircraft fire. By the end of 1966 there were 150 SAM sites and the North Vietnamese had 70 MiGs, including 15 MiG-21s.

The Soviet role throughout the rest of the war in Vietnam was that of supplier of sophisticated air defense equipment from radar to interceptors, as well as essential industrial supplies and conventional weapons such as tanks. A ding-dong battle emerged between the American attempts to counter the SAMs and the Soviet efforts to keep them effective. Both sides learned much.

30. SOVIET AIR POWER ALONG THE NATO FRONT

Soviet air power is organized in five main categories or groupings:

(1) fighter aviation of the homeland air defense (*Istrebitel'naya Aviatsiya/Protivo-Vozdushnaya Oborona*); (2) tactical aviation (*Frontovaya Aviatsiya*); (3) long-range aviation (*Dalnaya Aviatsiya*); (4) naval aviation (*Voenno-Morskaya Aviatsiya*); and (5) military transport aviation (*Voenno-Transportnaya Aviatsiya*).

²⁹Robert F. Futrell, "Air Power Against North Vietnamese Aggression, 1965-1971," in J. H. Scrivner, Jr. (editor), *A Quarter of a Century of Air Power*, AFROTC, Air University, 1973, p. 151.

³⁰*Ibid.*, p. 152.

The fighter component of PVO *Strany* is under the PVO commander, not the Air Force chief. Thus Marshal of Aviation Ye. Ya. Savitsky, commander of the PVO aviation gets his orders from the C-in-C of PVO *Strany*, Marshal of the Soviet Union P. F. Batitsky, who is also in control of the air defense of the non-Soviet Warsaw Pact countries. Savitsky has about 2,500 planes under his command, including third generation aircraft such as the MiG-25 FOXBAT.

About 80 percent of Soviet Frontal Aviation's aircraft are deployed opposite the NATO line from the tip of Norway to Turkey. Since Frontal Aviation has somewhat over 5,000 planes, this means that 4,000 are along the NATO front. If the tactical combat planes of the non-Soviet Warsaw Pact nations are included, the total comes to better than 6,000 aircraft. Frontal Aviation armies are under the control of the commander of the Military District to which they are assigned. There are four Frontal Aviation armies in Eastern Europe outside the USSR, and the rest are in the Soviet Union, one in each of the 12 Military Districts. One writer, however, claims that the North Caucasus, Volga, and Ural military districts do not have Frontal Aviation armies.³¹

Long-Range Aviation, or DA to use its Russian acronym, has about 800 long- and medium-range bombers. Most are medium-range Tu-16 BADGERS and Tu-22 BLINDERS. Somewhat over a hundred long-range

³¹R. Meller, "Europe's New Generation of Combat Aircraft. Part I: The Increasing Threat," *International Defense Review*, No. 2 (April) 1975.

Tu-95 BEARs and Mya-4 BISONs make up the strategic punch of the DA. The new BACKFIRE, however, has given the DA a new wallop. DA consists of three air armies, two deployed in European Russia and the other in the Far East. The C-in-C of DA, General Colonel of Aviation V. V. Reshetnikov, has his headquarters in Moscow. His forces would probably be under the control of the General Staff in case of a conflict.

Naval Aviation, C-in-C General Colonel A. A. Mironenko, has well over 700 combat aircraft including over 400 Tu-16 BADGERS, 50 Tu-22 BLINDERS, 50 Tu-95 BEARs, 50 IL-38 MAYs, and over 100 Be-12 MAIL seaplanes. In addition, there are a couple of hundred transports and well over 250 ASW helicopters. The new aircraft carrier, the KIEV, carries Yak-36 V/STOL aircraft and Ka-25K HORMONE ASW helicopters. Those Tupolev BACKFIRE bombers assigned to Naval Aviation have become a worrisome thing since they began operating from Murmansk to the Azores, overflying much of the Atlantic. They are being refueled by IL-76 CANDIDS or BISONs converted to aerial tankers. During the OKEAN 1975 global naval maneuvers, Soviet IL-38s and Tu-95s were able to use bases in Cuba, Guinea, and Berbera from which to fly long-range reconnaissance over the Atlantic and the western Indian Ocean. Admiral Gorshkov not only has a blue-water navy, but it also has eyes.³²

Military Transport Aviation, C-in-C General Lieutenant of Aviation G. N. Pakilev, has about 1,500 planes and 2,000 helicopters. In

³²For a good account see Norman Polmar, "Soviet Naval Aviation," *Air Force Magazine*, March 1976, pp. 69-75.

addition, the Military Transport command can call upon Aeroflot, civil aviation, for assistance. Actually, Aeroflot is a military force on loan to the civil authorities and it has a large fleet of medium-and long-range transports ranging from the obsolete IL-14 CRATE piston-engine job to the new supersonic Tu-144, comparable to the CONCORDE. The IL-86 wide-body transport, which will seat 350 people, is under construction and should be in service soon. Powered by four turbofan engines this should be a useful addition to Military Transport Aviation's inventory.

LARGE AEROFLOT TRANSPORTS

Soviet Designation	NATO Code	Engines	Passengers	Range (naut. mi.)
AN-10	CAT	4 turboprop	100	650
AN-24	COKE	2 turboprop	50	1,400
IL-18	COOT	4 turboprop	110	2,000
IL-62	CLASSIC	4 turbofan	185	4,000
IL-76	CANDID	4 turbofan		3,100
IL-86		4 turbofan	350	3,400
Tu-104	CAMEL	4 turbojet	100	2,000
Tu-114	CLEAT	4 turboprop	200	6,000
Tu-124	COOKPOT	2 turbofan	60	650
Tu-134	CRUSTY	2 turbofan	80	1,100
Tu-144	CHARGER	4 turbofan	140	4,000
Tu-154	CARELESS	3 turbofan	150	4,000
Yak-40	CODLING	3 turbofan	32	900

Chief Marshal of Aviation Pavel S. Kutakhov, C-in-C of the VVS, is in charge of only three of the five components of Soviet air power: Frontal Aviation, Long-Range Aviation, and Military Transport Aviation. Naval Aviation's C-in-C, Admiral Mironenko, gets his orders from the head man of the Navy, Admiral Gorshkov. And the PVO, as stated above, is a separate force in the Soviet military scheme of

things. Even within the VVS itself, Frontal Aviation armies are under the command of the C-in-C of the Military District to which they are assigned, Ground Force commander though he be.

The Soviet threats to NATO range from an end run around northern Norway to a push against Turkey and Greece. The main threat, however, is probably against the center of NATO, the Federal Republic or Germany and the NATO forces stationed there.

For all the Kremlin's worries about problems in the Middle East, with the PRC, in Africa, and in Southeast Asia, the main area of concern and thus the main area of deployment of its offensive and defensive forces is the central sector of NATO. The twenty Soviet divisions in East Germany are supported by the 16th Frontal Aviation Army, the biggest and best of the Frontal Aviation armies. It has over 1,000 tactical combat aircraft. Soviet forces in Czechoslovakia have about a hundred tactical combat planes and those in Poland about 400. There are also a few Soviet units in Hungary. At least 1,500 tactical combat aircraft of Soviet Frontal Aviation are deployed west of the Soviet boundaries. Poland, Czechoslovakia, and East Germany, the satellite tip of the Soviet spear aimed at Central NATO, have about the same number of tactical combat planes, thus there are about 3,000 tactical planes available to the Commander of the Warsaw Pact Forces without having to dip into those stationed in the Soviet Union itself.

The three westernmost Military Districts in the USSR are the Baltic, the Byelorussian, and the Carpathian. Frontal Aviation has

about 300 tactical combat aircraft in each of these MDs. In addition, it can draw upon the tactical aircraft of the Kiev MD and the Moscow MD, 100 and 300 aircraft respectively.³³

The tactical combat aircraft available to the Soviet Southern area (the satellites Hungary, Bulgaria, and Romania plus the Odessa, North Caucasus, and Transcaucasus MDs in the USSR) are much fewer than those in the Central region, some 900 tactical combat aircraft *in toto*. But the tasks facing the commanders in the south are proportionately less difficult.

The Northern sector, the Leningrad MD's area of responsibility, has the smallest component of tactical aircraft, some 200 or so. Its role would be to support Soviet Ground Forces attacking Norway and to help the Northern Fleet in any operation against Norway.

Soviet advances in aeronautical technology have given them the know-how to increase dramatically the payload and range of their combat tactical aircraft. Their third generation of aircraft can now operate from bases within the Soviet Union and hit targets deep in NATO territory. This new capability gives the Soviets a better chance of launching a surprise attack since they do not have to assemble their offensive aircraft on forward fields. For example, in 1969 the SU-7 FITTER A carried less than a ton of ordnance while its follow-on Su-17/20 FITTER C in 1971 carried four tons. Today, the latest Sukhoi fighter-bomber, the Su-19 FENCER can carry up to

³³"Europe's New Generation of Combat Aircraft," *International Defense Review*, April 1975, pp. 178-79.

eight tons. Penetration depth has been increased from around 100 miles in 1969 to over 500 miles today, depending upon payload.³⁴

Soviet outlays for aircraft have increased steadily over the last five years. According to a revised CIA estimate, the Air Forces' share of the Soviet expenditures for military forces went from 17 percent in 1970 to 20 percent in 1975. Only the Strategic Rocket Forces had a comparable increase.³⁵ Air Chief Marshal Sir Andrew Humphrey stated that not only was the Soviet Union outstripping the West in RDT&E, but was building "no fewer than 1800 military aircraft each year."³⁶

Soviet air power has come of age. Soviet "technological backwardness" is no longer a permissible cliché, not while contemplating the BACKFIRE, the MiG-23 and -25, the Su-19, or while looking at Yak-36 V/STOL planes taking off from the deck of the *Kiev*. Quantitatively, the Soviets are doing very well indeed. Soviet airpower has come a long way since a band of Bolsheviks inherited a small, mixed bag of foreign-type aircraft in November 1917. And by the look of things, the Soviet leadership is not about to rest on its laurels, but seems inclined to push air power at the same rate, or even a little faster, as the other services.

³⁴Peter Borgart, "The Air Attack Potential of the Warsaw Pact," *International Defense Review*, April 1975, pp. 193-99.

³⁵*Soviet Aerospace*, 24 May 1976, p. 31.

³⁶*Ibid.*, p. 28.

APPENDIX A

NATO AND SOVIET SYSTEMS FOR DESIGNATING AIRCRAFT

Western intelligence services, after World War II, assigned "Type" numbers to Soviet aircraft as they were first sighted since the Soviet seldom revealed their own designations. But the system soon got too confused to be very valuable, especially when it turned out that the MiG-15 had three different "Type" numbers. At that point, in 1954, NATO adopted a new system of nomenclature.

Under the new system, a code name was allocated to each new basic type of aircraft when it was first identified. Bombers were given names beginning with "B," fighters assigned names beginning with "F," and the names for transports began with "C." Miscellaneous fixed-wing aircraft were coded with names beginning with "M," and helicopters with "H." Piston-engine fixed-wing aircraft received one-syllable names and jets got two-syllable names. A variant of a basic type received a letter suffix as for example FISHBED (a MiG-21) and FISHBED-D (a MiG-21PF). In the better than two decades that have elapsed since the system was inaugurated, over 120 names have been applied to Soviet aircraft.

The Soviet system for designating their aircraft is somewhat confusing at times, at least to the outsider. Often the designation given by the design bureau differs from that later assigned when the plane goes into service with the VVS. And to fudge things up a bit more, a completely different designation is applied when the aircraft

is used to set new international records. For example, the FOXBAT, or MiG-25, was designated the Ye-266 when used to set new international records. But on the whole, the Soviet system is simple enough. The initial letters are an abbreviation of the name of the man for whom the experimental design bureau, or OKB (*Opytno-Konstruktorskoye Byuro*), is named. For example, the famous designation MiG indicates an aircraft designed by the Mikoyan and Gurevich OKB, while the Tu stands for the famous Tupolev OKB. The letters are followed by a number, successive numbers indicating the chronological appearances of new aircraft, e.g. MiG-9, MiG-15, MiG-17, etc. Fighters get odd numbers (MiG-15), while all other types get even numbers (Tu-16, a bomber; Mi-6, a helicopter; IL-18, a transport).

Variations on the basic types are designated by letter suffixes. For example, the MiG-17 is a *fighter* as its odd number would indicate; but when a "P" is added to the number as in MiG-17P, this indicates that its main role is that of an *interceptor* since the "P" stands for the Russian word *Perekhvatchik* meaning interceptor. Sometimes the number is followed by more than one letter suffix as in MiG-17PF, where F (*Forsirovanny*) stands for "boosted," usually meaning the engine is equipped with an afterburner.

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